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RAILROAD MAN'S MAGAZINE

TUNNELING *with the* TOOLS *of the* TITANS

"HURRY-UP" BILL - ENGINEER
A Mystery Novel *of the* R.R. *by* Charles Wesley Sanders

SPIKE MALONE *on the* INTERURBAN

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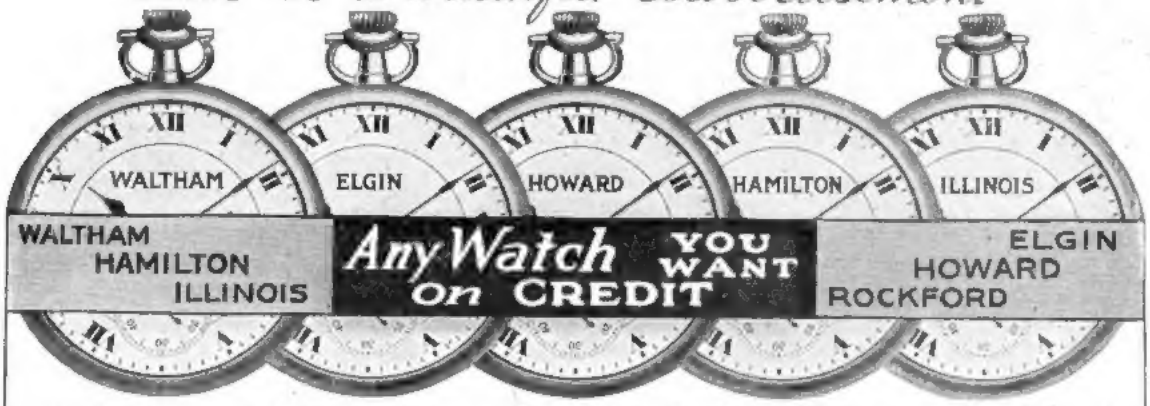

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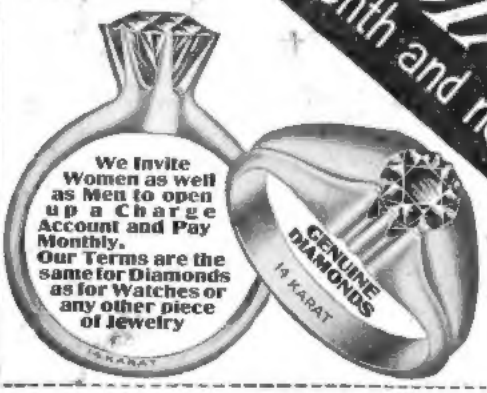
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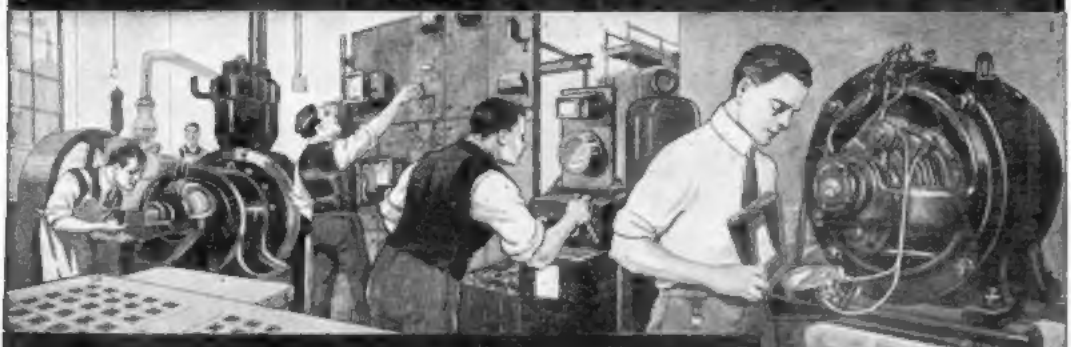

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RAILROAD MAN'S MAGAZINE

CONTENTS FOR JUNE, 1917

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FEATURES

TUNNELING WITH THE TOOLS OF THE TITANS. (Illustrated)	Marlen Pew	177
RAILS EARN BILLION A YEAR		204
PITY THE POOR YARDMASTER! (Illustrated)	Charles Frederick Carter	213
OLD TIMES ON THE COMSTOCK	Sam P. Davis	225
BIGGEST EXPORT COAL-PIER. (Illustrated)		232
RAILWAYS ARE GETTING SAFER. (Illustrated)		237
SAFETY CELL FOR ENGINEERS. (Illustrated)		248
CRATING A LOCOMOTIVE. (Illustrated)	J. W. Greenberg	262
HE KNOWS COAL! (Illustrated)	Melville Hatch	277
NEW RAIL LEVIATHAN. (Illustrated)		280
EVOLUTION OF R. R. RULES	Theodore Benton	288

FICTION

MALONE ON THE INTERURBAN	John C. Russell	195
RIGHT ON THE RIGHT-OF-WAY	Mark Harmon	206
THE WIRE-TAPPER	Will Sebelle	241
CONDUCTOR "POP" INTERFERES	Emmet F. Harte	271
THE TRUTH ABOUT THE WRECK	Hartley Edgington	283
"HURRY-UP" BILL—ENGINEER. (A Railroad Mystery Novel Complete)	Charles Wesley Sanders	297

DEPARTMENTS

FROGS	202
THE SUNNY SIDE OF THE TRACK	231
THE THROTTLE WIDE OPEN	235
BY THE LIGHT OF THE LANTERN	250
TELEGRAPHIC AND TELEPHONIC	257
WITH THE INVENTORS. (Illustrated)	267
ON THE EDITORIAL CARPET	347

MISCELLANY

U. S. GIVES GERMANS R. R. RIDE. (Illustrations)		194
CANADA'S FIRST R. R. TRAIN. (Illustrated)		201
WIRELESS. (Poem)	Charles H. Meiers	211
R. R. RUNS SCHOOL ON WHEELS. (Illustrations)		212
STILL A PROFESSIONAL. (Poem)	J. E. Middleton	224
WE WANT ODD PHOTOS		234
THE FLAGMAN. (Poem)	John G. Gartland	240
"THE OLD GIRL." (Poem)	W. E. Nesom	247
WATCHERS. (Poem)	Paul Steele	266
A TUNNEL UNDER A TUNNEL. (Illustration)		276
JIM HILL'S COUNTRY. (Poem)	Lydia M. Dunham O'Neil	282
WORLD'S YOUNGEST "VAG." (Illustrated)		287
WISDOM AND PHILOSOPHY	193, 230, 261, 270, 279, 295	
THROUGH THE CAR-WINDOW. (Illustrated)		296
STRAIGHT DOPE. (Poem)	J. E. Chrisman	346
THE RAILROADER'S MAIL-BAG		348
SONGS BY BARDS OF THE RAIL		352

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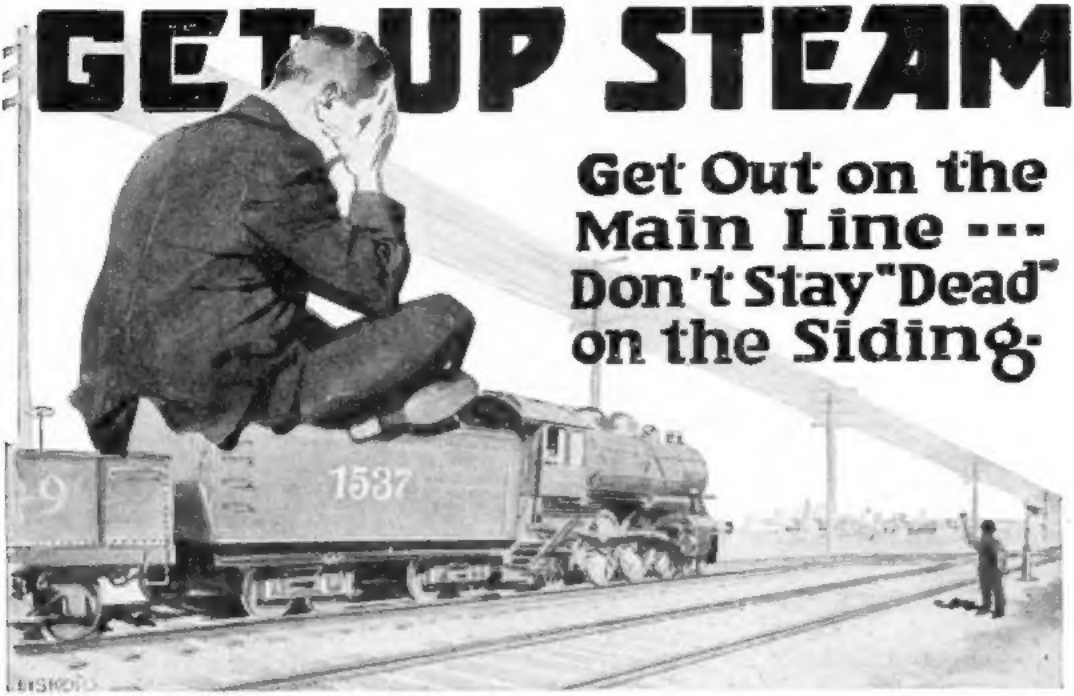

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F6

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Good Pay, Easy Work, Vacations, Position for Life

Earn $75 to $150 a month from the start.
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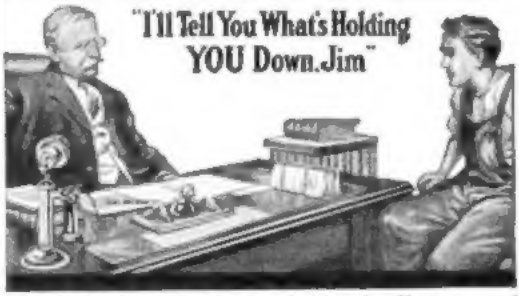

"To be frank, you're short on headwork. You are good at packing and nailing up boxes, but many of our men can do as well. What we need right now is a Traffic Manager—a man who knows freight and express rates, classifications, and routing of shipments. Such a man could save us thousands of dollars every year, and we could well afford to pay him a good salary. But you can't fill *that* job—you haven't the training. If you had looked ahead of your job and prepared in spare time for such work, there would be a good position with a good salary open to you right now."

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Ranger Electric Lighted Motorbike

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and *freight prepaid* on a new 1917 **"RANGER"** bicycle. **Write at once** for our *big catalog* and *special offers.* Take your choice from 44 styles, colors and sizes in the famous **"RANGER"** line.

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Boys, be a **"Rider Agent"** and make big money taking orders for bicycles and supplies. Get our *liberal terms* on a sample to introduce the new **"RANGER."**

TIRES equipment, sundries and everything in the bicycle line, at *half usual prices. Write today.* A post card will do.

MEAD CYCLE COMPANY Dept. T-31, Chicago

F9

Various Headaches

"It is necessary in order to treat headaches properly to understand the causes which produce the affection," says Dr. J. W. Ray of Blockton, Alabama. Continuing, he says, "Physicians cannot even begin the treatment of a disease without knowing what causes give rise to it, and we must remember that headache is to be treated according to the same rule. We must not only be particular to give a remedy intended to counteract the cause which produces the headache, but we must also give a remedy to relieve the pain until the cause of the trouble has been removed. To answer this purpose Anti-kamnia Tablets will be found a most convenient and satisfactory remedy. One tablet every one to three hours gives comfort and rest in most severe cases of headache, neuralgia and particularly the headaches of women.

FOR SICK-HEADACHE

If a patient is subject to regular attacks of sick-headache, he should take two A-K Tablets when he feels the least sign of an oncoming attack. These tablets are prompt in action, and can be depended upon to produce relief in a very few minutes. Such patients should always be instructed to keep their bowels open.

Influenza or LaGrippe

It is quite refreshing these days to read of a clearly defined treatment for Influenza or La Grippe. In an article in the "Lancet-Clinic," Dr. James Bell of New York City, says he is convinced that too much medication is both unnecessary and injurious.

When called to a case of La Grippe, the patient is usually seen when the fever is present, as the chill which occasionally ushers in the disease has generally passed away. Dr. Bell then orders that the bowels be opened freely with salts, citrate of magnesia or other laxative. For the high fever, severe headache, pain and general soreness, one Anti-kamnia Tablet every two hours is quickly followed by complete relief.

A Remedy for Pain

"The efficiency of any drug," says Dr. C. F. Robbins, "is known to us by the results we obtain from its use. One of the principal symptoms of all diseases is pain, and this is what the patient most often applies to us for, i. e. - something to relieve his pain. If we can arrest the pain promptly, the patient is most liable to trust in us for the other remedies which will effect a permanent cure. One remedy which I have used largely in my practice is Anti-kamnia Tablets. Many and varied are their uses. I have put them to the test on many occasions, and have never been disappointed. I found them especially valuable for headaches of malarial origin, where quinine was being taken. They appear to prevent the bad after-effects of the quinine. Anti-kamnia Tablets are also excellent for the headaches from improper digestion, also for headaches of a neuralgic origin, and especially for women subject to pains at certain times. One or two Anti-kamnia Tablets every two or three hours give prompt relief."

Acute Rheumatism

In the hands of one observer we find that a certain drug has been used with the utmost satisfaction; others have found the same remedy to be a great disappointment. All physicians however agree that every method of treatment is aided by the administration of some remedy to relieve the pain and quiet the nervous system, and Dr. W. S. Schultze expresses the opinion of thousands of practitioners when he says that Anti-kamnia Tablets should be given preference over all other remedies for relief of the pain in all forms of rheumatism. They are also unsurpassed for headaches, neuralgia and all pain.

Indigestion-Dyspepsia

Are you distressed after eating? Do you have nausea when riding in the cars, or on the train or boat? Take one A-K Tablet and get relief.

When to Take Anti-Kamnia Tablets

As a Pain Reliever—In headache, migraine, coryza, la grippe and its after-effects.

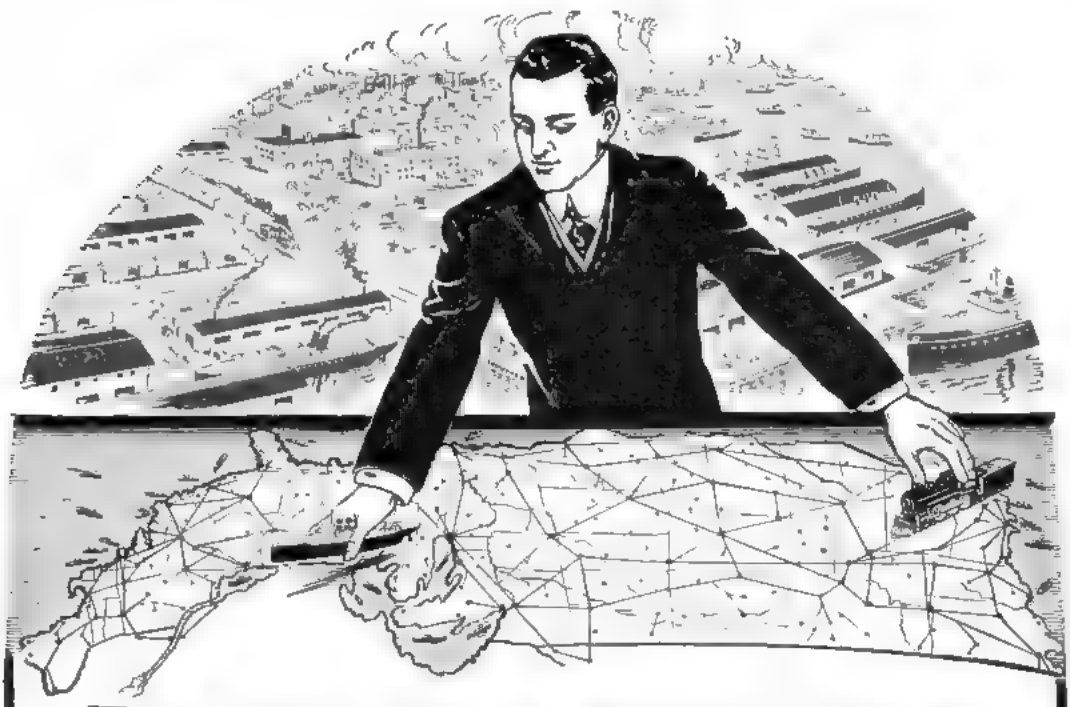
As an Anodyne or Sedative—In indigestion, gastralgia, dyspepsia, hysteria, insomnia, car-sickness, sea-sickness, worry and sight-seer's fatigue.

As an Antipyretic—In intermittent, puerperal and malarial fevers, bronchitis, pleurisy, etc.

As an Anti-Neuralgic—In acute or chronic neuralgia, facial neuralgia, earache, toothache and pains of sciatica.

As an Anti-Rheumatic—For the pain in acute or chronic rheumatism and gout.

All genuine Anti-kamnia Tablets bear the AK monogram. At all druggists in any quantity or in 10c and 25c packages. Ask for A-K Tablets and insist on getting them.



This Man Earns $100 a Week

He knows how to open up large markets and help his employers outstrip competition in business because he knows how to route shipments, obtain shortest mileage, lowest rates, and quickest deliveries. He knows how to classify goods and reduce transportation costs. His knowledge of traffic laws and transportations saves his employers thousands of dollars annually

Here's your chance to qualify for the same kind of a position at the same salary. Don't let this chance go by. Few men have this traffic knowledge. The demand far exceeds the supply. In fact, over half a million firms need men who can classify commodities and secure ratings most economically. You can be able to answer this call for trained traffic men quickly by means of the LaSalle Home Study Course. We guide you step by step. With the LaSalle Extension University behind you, you can qualify in a comparatively short time. The expense is so small and the terms so easy you will scarcely miss the money. Qualify for a bigger job—at home—in spare time.

Be a Traffic Man

At $35 to $100 a Week

There seems to be no limit to the salaries expert traffic men are paid Some concerns pay the director of traffic $10,000 or more a year. Salaries of $50 to $100 a week are commonly paid to traffic managers. Splendid positions with high salaries for competent, trained men are open everywhere.

We Train You By Mail For a Big Traffic Job

You need not leave your present position. You may keep on earning while learning.

Our course is recommended and endorsed by railroad executives and big business concerns throughout the country. Your training is under the supervision of a large corps of the most prominent traffic experts in the country, headed by N. D. Chapin, until his present connection with us, Chief of Tariff Bureau New York Central Lines. The Course gives you also a thorough understanding of Interstate Commerce Laws and prepares you for every duty required of a high grade traffic manager: how to route shipments, obtain shortest mileage, classify goods, secure quickest deliveries and lowest rates in fact, trains you so that you can qualify for an immediate high salaried railroad or industrial traffic position.

LaSalle Extension University,
"The World's Greatest Extension University"
Dept. 665-C **Chicago, Ill.**

Send In the Coupon

For proof that our graduates, because of the thoroughness of their training through our course, qualify for the best positions and increase their earning capacity. Let us send you letters from students and full details concerning the LaSalle University Home Course in Traffic Management. Send in the coupon now and receive our free book **"Proof,"** letters and full details by return mail.

Free Book Coupon

LaSalle Extension University,
Dept. 665 C Chicago, Ill.
"The World's Greatest Extension University"

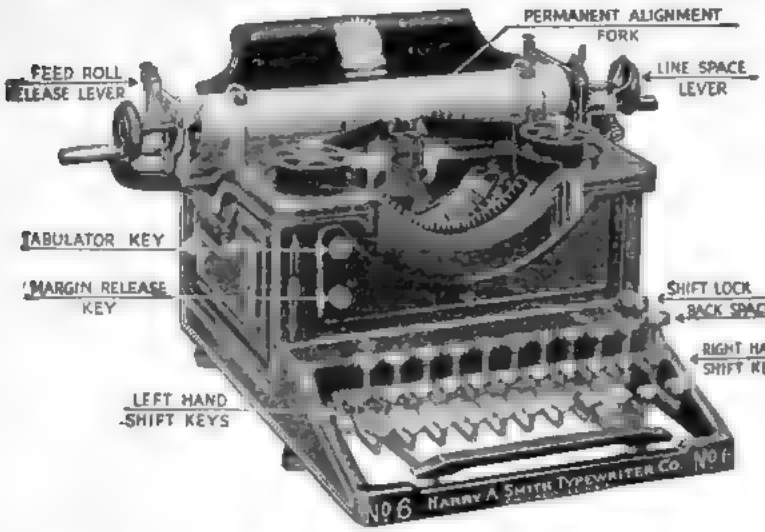
Send Free Book about opportunities now open to TRAFFIC EXPERTS with LaSalle University Training. It is understood that I am not obligating myself in any way.

Name .....

Address .....

City ..... State.....

F11



I want the page of this advertisement to establish as friendly business relations with you as I possibly can. I want you to realize also, that it is my earnest effort and intention to give you full, honest value for every dollar that you spend with me. This is the only way I can succeed. My advertisement has appeared in this magazine continuously for more than four years.

I am building up my business on the foundation of good value and square dealings. I am saving thousands of satisfied customers thousands of dollars, by supplying, perfect—late style—visible writing typewriters, at remarkably low prices.

All my transactions are handled throughout by personal correspondence. I assure you every courtesy and consideration in your dealings with me. Your order will have my prompt, careful, personal attention. I will be glad to do business with you.

Harry A Smith

TYPEWRITER SENSATION

Free TRIAL—Use As You Pay

Send me only $2.00 a month until the low total price of $34.15 is paid, and the machine is yours

This is absolutely the most generous typewriter offer ever made. Do not rent a machine when you can pay $2.00 a month and own one. Think of it. Buying a $100.00 machine for $34.15. Cash price, $32.30. Never before has anything like this been attempted.

Standard Visible SMITH Model No. 6

Perfect machines, Standard Size, Keyboard of Standard Universal arrangement, writing 84 characters, universally used in teaching the touch system. **The entire line of writing completely visible at all times,** has the tabulator, the back spacer; in fact, every late style feature and modern operating convenience. Comes to you with everything complete, tools, cover, operating book and instructions, ribbon, practice paper—nothing extra to buy. **You cannot imagine the perfection of this beautiful typewriter until you have seen it.** I have a thousand of these perfect latest style Model No. 6 typewriters at this bargain price and each purchaser [illegible] enough, I want one of these beautiful machines must try it out in home or office for five days before deciding to buy. I will send it to you F. O. B. Chicago for five days' free trial. It will sell itself, and if you are not satisfied that this is the greatest typewriter bargain you ever saw, you can return it at my expense. You won't want to return it after you try it—**you cannot equal this wonderful value anywhere.**

H. A. SMITH
Room 318-231 N. Fifth Ave.
CHICAGO, ILL.

Ship me a No. 6 Smith F. O. B. Chicago, as described in this advertisement. I will pay you the $28.80 balance of the SPECIAL $34.15 purchase price, at the rate of $2.00 per month. The title to remain in you until fully paid for. It is understood that I have five days in which to examine and try the typewriter. If I choose not to keep it I will carefully repack it and return it to the express agent. It is understood that you give the standard guarantee for one year.

Name .....

Address.....

.....

You Take No Risk—Put In Your Order *Now*

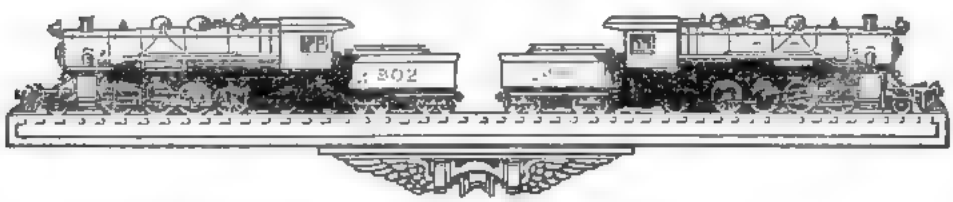
When the typewriter arrives deposit with the express agent $6.15 and take the machine for five days trial. If you are convinced that it is the best typewriter you ever saw, keep it and send me $2.00 a month until the bargain price ($34.15) is paid. If you don't want it, return it to the express agent, receive your $6.15 and return the machine to me. I will pay the return express charges. This machine is guaranteed just as if you paid $100.00 for it. It is standard. Thousands and thousands of people own and use these typewriters and find them the best ever made. Satisfied.

The supply at this price is very limited. The price will probably be raised when my next advertisement appears, so don't delay. Fill in the coupon today, mail to me, the typewriter will be shipped promptly. There is no red tape. I employ no canvassers, no collectors, no chattel mortgage. It is simply understood that I retain title to the machine until the $34.15 is paid. You cannot lose. It is the greatest typewriter opportunity you will ever have. Do not send me one cent. Get the coupon in the mails today—sure.

Harry A. Smith 318-231 N. Fifth Ave. Chicago

RAILROAD MAN'S MAGAZINE

Vol. XXXIII. JUNE, 1917. No. 2.



TUNNELING WITH THE TOOLS OF THE TITANS.

Impact of Human Activity Has Forced Transportation Underground and Made Traveling Public a Race of Gophers.

NEW MACHINE NIBBLES ITS WAY.

Man Has Been Digging through Rock for Centuries—Remarkable Feats of the Egyptians—Drill and Blast Gave Great Impetus to the Modern Art—Wide-Spread Use of Sub-Surface Passages Followed Advent of Steam Railways—Amazing Achievements in Recent Building—Glimpse at the Future.

BY MARLEN PEW.

WE have become a nation of gophers.

A constantly increasing amount of the time of every man who travels is spent beneath the surface of the land.

Under the impact of the great, heaving, insistent population in this top-speed country, transportation worms its way under the city streets, through mountains, beneath rivers, through the muck of quicksand marsh—takes any course that is demanded, defying heretofore insuperable engineering difficulties.

Man desires to go somewhere and go in a hurry. He gladly will pay the bill.

All right, says transportation genius *Zip!* The steel blade rams its nose into the mountainside, and presently the gentlemen who are willing to pay their way are riding in parlor-cars under millions of tons of rock and shale and snow-capped peak, instead of around them Perhaps they do not even realize that they are passing through a tunnel that may have cost millions of dollars and the effort of a thousand men of brain and brawn to construct

OLIVER O APP, OF NEW YORK, IS THE MAN WHOSE INGENUITY GAVE US THE CURIOUS MECHANISM, ALMOST HUMAN IN ITS DEFTNESS, WHICH BORES ITS WAY THROUGH SOLID GRANITE AS EASILY AS A RAT EATS THROUGH CHEESE

Popular Demands

The mighty network of transportation caverns in the United States, and the constantly increasing webs of underground passages in the large cities, are but an evidence of the speed and efficiency of a population whose chief motive seems to be to crowd into every day's experience a maximum of activity

If activity is life, we are living many times as long as our grandparents lived and we are constantly demanding more It is not at all uncommon now to hear men refer to their ages in terms of experience, rather than by years from the date of birth.

A well-known American, appearing to be in middle life, said to the writer recently when questioned as to his age:

"I must be between three hundred and four hundred years old, as men go. According to the calendar I am fifty-two My father died at fifty. I have had fully six or eight times more experience than he "

It is that spirit of activity, begetting the means in every direction, which accounts directly for the phenomenal out spreading of transportation and the tightening of the gears of speed facilities, an important feature of which is the railroad tunnel

As a matter of fact, there are not a great number of railroad tunnels that are absolutely necessary in the scheme of

reaching a destination. Most of this difficult and expensive building is for the purpose of reaching the destination by a shorter route on a more economical and scientific grade. When the elements of time and economical operation are in the balance, the decision is with them over almost any obstacle, be it river, swamp, or mountain.

There is, perhaps, no feature of railroad construction more progressive and more interesting than this driving of rights-of-way beneath the earth's surface. From the almost incredibly crude methods of the ancient tunnel-builders, the science has come down to new mechanical means that are fairly uncanny in operation.

Tunnel Progress.

While, since the discovery of gunpowder, and later dynamite, as a blasting agent, tunneling methods have been fairly exact, during the past sixty-six years inventive genius has slowly developed rock-tunneling machines which not only bore through hard rock more quickly, cheaply, and safely than the drill-and-blast method, but move on precise schedule and with predetermined efficiency. It has been only very recently, however, that these machines have come into what appears to be practical use.

It is marvelous to see this almost human mechanism gnawing its way through solid rock, as patient and as certain to penetrate as a mouse to nibble away the fabric of a pine cupboard door. The mouse simile is not inappropriate in this connection, for the rock-tunneling machine, with its revolving and biting chisel-teeth, acts similarly to the gnawing rodent, striking the hard face of the rock with quick, incisive strokes, and chipping away the surface with remarkable speed.

One of these machines, developed by Oliver O. App, has recently demonstrated its possibilities in the subway excavation under the Grand Central Terminal, in New York.

The machine seems to be entirely practical, and if it stands the tests of time, it —together with other machines by other inventors now under demonstration or perfection—will mark a triumph of science over many years of disheartening and futile investigation.

It is not to be supposed, however, that this machine is the only successful rock-drilling device, or the most extensively used. As a matter of fact, it is only one of several types of rock-drills in operation in this country and abroad, but is of particular interest because it is the newest development.

Probably the two best-known types of drills in use in America to-day are the Leyner and the hand-hammer. The former was invented by J. George Leyner and works on the principle of the hand-hammer blow, mechanically applied. Water and air, under pressure, are fed to the drill-bit to keep it cool, free from dust, and clear of rock-cuttings.

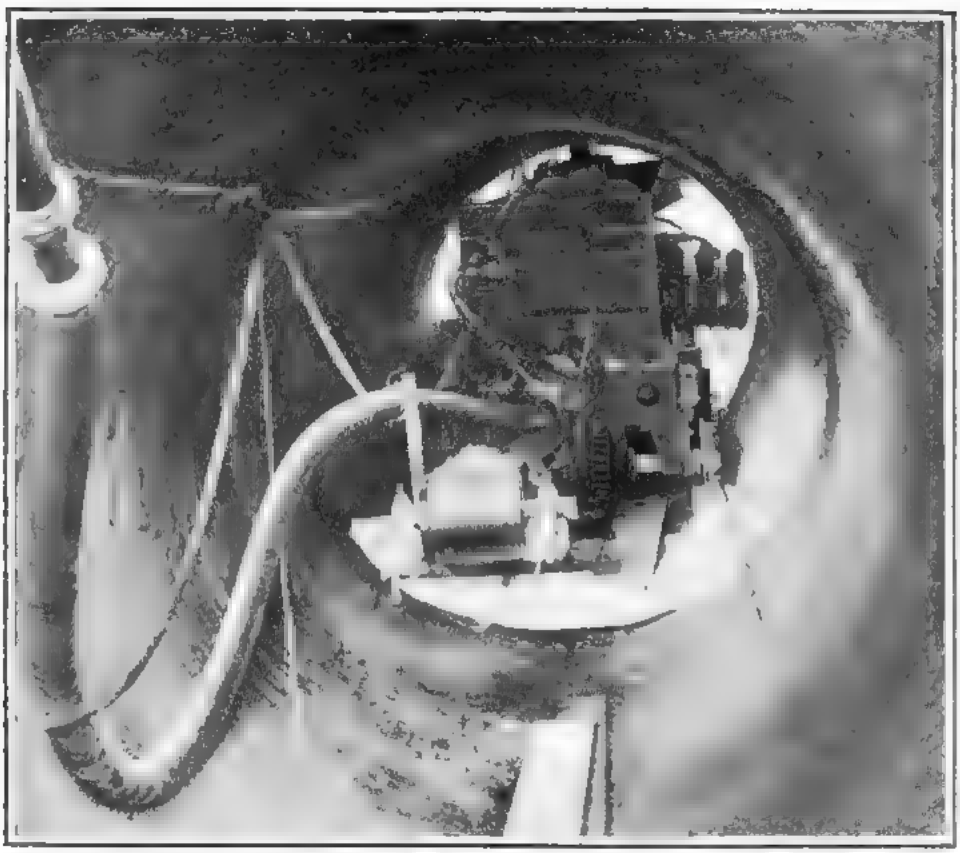
The hand-hammer drill, operated on very much the same principle, is a very light contrivance which can readily be carried around and operated by one man. It can also be mounted and demounted without difficulty, and it works rapidly and economically.

With such tunnel-making machines in operation, boring the whole diameter of a tunnel and progressing through solid rock by compressed-air pressure, ten or twenty feet, or in excess of that, per day, the immediate future will see tremendous strides in tunnel-making in this country.

Transit Catacombs Increasing.

Throughout the world there will be an increasing use for the underground passage, whether for transportation, or for mining, draining, or other various uses to which the tunnel is adaptable. The rock-nibbling machine will go to places that daunt men equipped only with drills and blasting explosives.

It always takes a bit of the conceit out of us when we read the musty pages of history and find how the ancients, with the most primitive tools, achieved marvelous feats in building. If the Egyptians built



ADVANCING THROUGH HARDEST STONE AT THE RATE OF NINE FEET IN TWENTY FOUR HOURS, THE ROCK-DRILL DEVELOPED BY MR APP, AND NOW IN USE IN NEW YORK SUBWAY CONSTRUCTION WORK, DOES AWAY WITH THE OLD DRILL-AND-BLAST METHOD. IT BORES AN EIGHT-FOOT HOLE, LEAVING A FINE, SMOOTH SURFACE, AND IS IMPELLED BY COMPRESSED AIR

the stately pyramids on engineering lines that, considering the instruments with which they had to work, would floor the genius of this day, it is also true that they employed the art of excavating underground in most amazing fashion

With explosives undreamed of, with no machinery, and with drilling tools that we would not consider fit to dig ditches with, the ancient Egyptians and Hindus created many wonderful subterranean temples and sepulchers in hard rock. The art was also known to the early Hebrews, Greeks, Romans, Peruvians, Etruscans and Aztecs, as well as to other peoples in the dim dawn of civilization, as attested by similar monuments still intact

The Egyptians were especially notable for their knowledge of quarrying and for underground excavation. In the catacombs of Alexandria, the tombs near Thebes and the temples of Ipsamboul—both of these structures hewn out of solid rock—may be seen the remains of their work, dating back to 1,500 years before Christ. The rock-cut temples constructed in the reign of the famous Rameses II were some of the finest works of the sort in history.

It is stupendous to think that these excavations were cut by the hands of men armed only with such simple tools as granite saws of copper or bronze, sometimes fed with emery powder, and crude metal spikes and stone-headed hammers The ancients, to break rock, knew how to hand-drill grooves on four sides of a block and fill them with wooden wedges

which were soaked with water, the swelling action producing sufficient power to crack the stone.

The first rock excavations were, of course, for the purpose of satisfying the religious and superstitious fancies of the rulers. In India are to be seen the remains of hundreds of excavations used as chapels and monasteries, with cells cut from solid rock and used as the residences of monks and ascetics.

It is believed that tunneling was known to an ancient Grecian people 2,000 years B. C. A series of sixteen shafts are to be seen near Lake Kopias in Boeotia, believed to have been constructed for the ventilation of an ancient drainage tunnel.

Early Mine Tunnels.

Tunneling was used for silver-mining in Attica half a century before Christ. Gold was similarly mined in Macedonia and Thrace as early as the fifth century B. C.

The Aztecs mined copper by tunneling. The ancient Peruvians built a wonderful aqueduct to drain Lake Coxamarco.

The greatest tunnels of ancient times were built by the Romans. They used them for passage, drainage, water-supply, and mining, some being of great size.

One, draining a lake near Rome, was three miles in length, 19 feet high, 9 feet wide. It was completed 52 A. D., and took eleven years of labor. Some of the Roman tunnels are in use to this day.

One method of tunneling in ancient times was to heat rock to a tremendous temperature and then suddenly quench the fire with water, precipitating disintegration and crumbling. Slaves and prisoners of war were put at this murderous work, and thousands perished.

All through the history of ancient building runs the evidence of utter disregard of human life. The early builders seemed to have no respect for the safety of the workers.

Not only did they require withering effort, but the life-blood of their miserable slaves and war prisoners. The sufferings of these wretched men spell the progress of ancient tunneling.

In the middle ages tunneling was almost exclusively carried on to meet the requirements of war. However, in 1450 a tunnel, intended to pierce the Alps at an elevation of some 6,000 feet and open easy communication between Nice and Genoa, was begun, but was never finished. A total of about 8,000 feet of the tunnel was opened.

First Blasting.

Gunpowder as an aid to mining was introduced in 1613, and the exact fundamental principle of drilling and blasting employed the world over to-day was then established. By 1650 these means were in common use and gave tremendous impetus to the industry.

It was not, however, until the eighteenth and nineteenth centuries that tunneling grew to great proportions, and this growth was due to the demands of transportation. Many tunnels were built in connection with the canals, which, aside from the wagon-roads, were the only means of overland transportation at that time. The tunnel became an essential factor with the advent of the steam railway, and the need of maintaining level gradients made an enormous demand for them.

Commercial transportation had as its first modern tunnel that of the Malpas, on the Languedoc Canal in France. This tunnel was 515 feet long, 22 feet wide, and 27 feet high; it was completed in 1681. It traversed country believed to have been impassable.

A tunnel on the St. Quentin Canal in France, begun in 1822, was 39,400 feet in length. In the nineteenth century France had 93,500 feet of canal tunnels.

The first transportation tunnel in England was 8,640 feet in length. It was opened for traffic in 1777. By 1856 England had 220,000 feet of such tunnels.

In the United States the first tunnel, for a canal, was built at Orwisburg Landing, on the Schuylkill Navigation Canal.

It was begun in 1818 and completed in 1821. This tunnel was 450 feet long, and pierced a hill of red shale

Lebanon Tunnel, on the Union Canal, finished in 1826, was 720 feet long. Then came the Conemaugh and Grant's Hill

a steam-locomotive propelled train was built on the Liverpool and Manchester railway. It was with the extension of the railroad that tunneling operations multiplied rapidly

The St Germain line in France had

FOURTEEN PNEUMATIC HAMMERS, ARRANGED ON A LONGITUDINAL AXIS, AND FITTED WITH CHISELS, CHIP AWAY THE SOLID ROCK IN GREAT CONCENTRIC CIRCLES PART OF THE APP MACHINE'S SUCCESS IS DUE TO THE COORDINATION BETWEEN HAMMERS AND CHISELS AS SOON AS ANY OF THE LATTER ARE NOT BEARING AGAINST THE ROCK, THE AIR SUPPLY STOPS AUTOMATICALLY WHEN ROCK IS STRUCK AGAIN THE HAMMER RESUMES OPERATION

tunnels on the Western Division of the Pennsylvania Canal, completed in 1830, the Pawpaw Tunnel on the Chesapeake and Ohio Canal, built in 1836, and two tunnels on the Sandy and Beaver Canal in Ohio, finished in 1836

Enter Railway Tunnels

The first record of a railroad tunnel is that of the Terre Noire, near St. Etienne France, on a horse railroad known as the Roanne-Andrezieux. It was begun in 1826, and was over 4,000 feet long

In 1830 the first tunnel to be used by

several famous tunnels, more than 42,000 feet of them in fact, by 1845. Thus the use of the underground passage spread over the world.

The first railway tunnel to be constructed in this country was on the Allegheny Portage Railroad in Pennsylvania, built in 1833. It was 901 feet in length, and was lined with 18 inches of masonry

The Black Rock tunnel on the Philadelphia and Reading line and the Elizabethtown tunnel on what is now the Pennsylvania Railroad, were complete by 1835.

and after this time tunneling for railroads became so general that forty-eight such excavations had been made by 1850.

By hand-drilling and with black powder the first large mining-tunnel in the United States was driven at Mauch Chunk, Pennsylvania, in 1824. It was known as the Hacklebernie. It went 790 feet through hard conglomerate, and was later extended to 2,000 feet.

When nitroglycerin was discovered by Sorero, in 1847, drilling for tunnels received a tremendous impetus. Two years later J. J. Couch, of Philadelphia, brought out the first percussion rock-drill.

A direct-action percussion drill, which inventors quickly improved upon, came to the hands of engineers in 1851.

Nobel was first to apply nitroglycerin as a blasting agent. Gun-cotton was tried at the Hoosac Tunnel in 1865, but nitroglycerin was soon substituted. Burleigh drills were tried, and proved successful, at the Hoosac Tunnel in the same year.

In 1867 Nobel discovered dynamite. No other factor has been so potent in the industry as this discovery, which accounts for the wonderful tunneling progress made in recent years. Despite the strides in mechanical means, dynamite is still the leading excavating agency, and doubtless will continue to be for a considerable time.

Advent of Machine.

A tunneling machine was constructed at Boston in 1851 for use in the famous Hoosac Tunnel. It weighed 70 tons, and was designed to cut a circular groove 13 inches wide and 24 inches deep in the face of the tunnel.

The method was by revolving cutters, The machine cut through ten feet of rock, and then failed and was cast aside.

This experiment was followed by a dozen or more attempts to construct practical machines. The early inventors had the fundamental ideas all right; but they did not possess compressed-air power as we have it to-day. Their experimentation was costly and disheartening, but it all comes down to us to-day in machines that are actually doing the work.

The App mechanical rock-worm, the appearance of which in New York's subway has created great interest, appears to be highly perfected. It is made to cut away the rock by the action of a number of pneumatic hammers fitted with chisels, the arms turning on a longitudinal axis.

A feature of the instrument is that when a chisel is not bearing against the rock there is no action by the hammer. However, as soon as the chisel comes into firm contact with rock, the hammer, by automatic action, proceeds to beat, and the rock is chipped away.

More air-pressure is applied automatically as the rock becomes harder. When the chisel is working on soft rock, the air-pressure is reduced.

Almost Human.

This uncanny machine gives off just as much pressure as the work in hand requires. When very soft rock or shale or dirt is encountered, no hammering is required, and the chisels merely cleave away such materials by the rotation process.

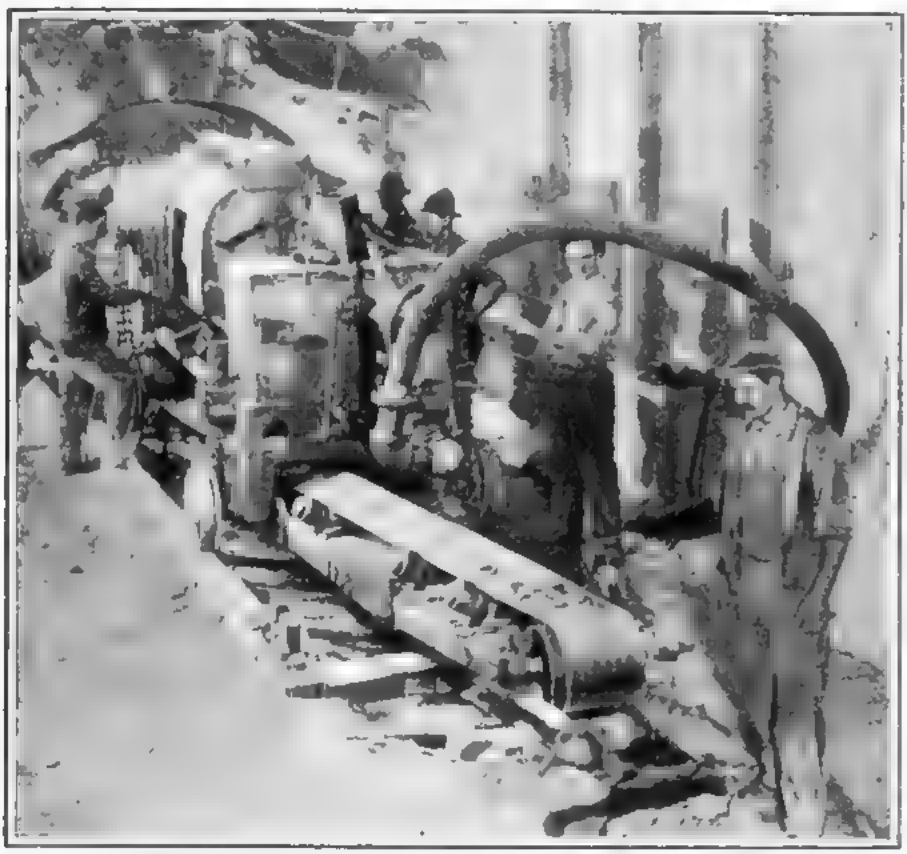
It is this reciprocal action, one might say "understanding," between the hammer and the chisel that is the secret of this machine's success. The machine is so arranged that practically the entire face of the tunnel is covered at each revolution of the head.

The drills carry a flat, wedge-shaped bit, and the automatic stoppage of the hammer prevents damage to the machine whenever a tool breaks or a crack or seam in the rock is encountered. A definite angle is established for the chisels, and they go round and round, following each other in order, and chip and flake away the rock, instead of trying to pulverize it, as other unsuccessful machines have attempted.

The head of this machine is provided with a flange and shield, so arranged that the cuttings are lifted from the bottom of the bore and discharged upon a belt-

conveyer which, in turn, delivers them to the tunnel-cars in the rear. Air is applied to the drills through the center of the rotating shaft which carries the head The entire machine is mounted on wheels

The compressed-air engine is located on the forward part of the carriage. There is a spray of air and water over the face of the rock constantly, thus preventing chips and dust from entering and ruining



THE APP MACHINE'S CARRIAGE IS MADE UP OF A TWO-WHEEL MAIN TRUCK AT THE REAR AND A GUIDE TRUCK IN FRONT THE MUCK IS CARRIED OUT BY MEANS OF THE BELT CONVEYOR SHOWN IN THE PHOTOGRAPH A LIGHT TRACK OF STANDARD GAGE IS USED

on a standard-gage track, facilitating movement in the tunnel.

The front and rear halves of the machine are separate. The front, carrying the revolving head, goes forward an inch a revolution by means of two lead-screws When the front has advanced two or three feet, the gearing moves up the rear half

There are four arms, placed 90 degrees apart. Two carry four hammers each and two carry three hammers each. The arrangement of these fourteen hammers makes for cutting concentric circles

the machine. The hammers weigh 32 pounds and are 12 inches long

The distribution of the air is controlled by the passing of the hammer over ports in the cylinder-wall, there being no distributing-valves. The hammer strikes a steel chisel-holder, which grips the chisel The air also carries the oil for lubrication

Cut and Break

Another like device, the Bennett tunneling-machine, consists of a battery of 46 pneumatic hammer-drills mounted on

a rectangular head. It can be given a vertical as well as a transverse motion

After the face of the tunnel has been drilled full of holes by this machine, the head is backed away and the shells between the holes are knocked away with hammers. The machine was demonstrated near Golden, Colorado

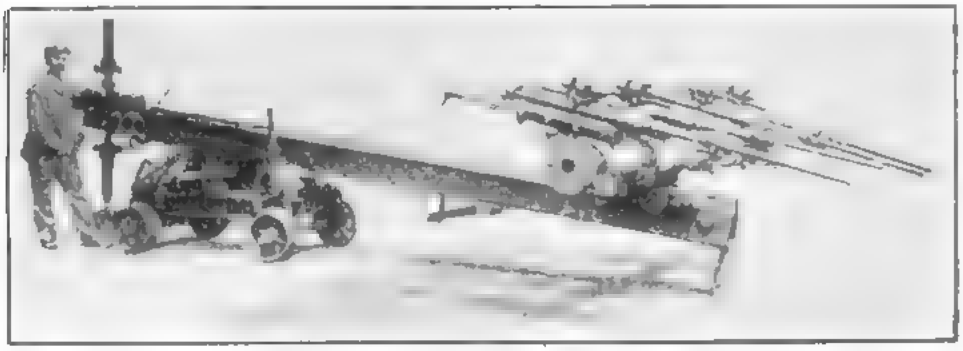
Still another machine, manufactured under what are known as the Fowler patents, consists of a narrow, swinging, rectangular cutting-head, full size of the tunnel, with 41 rock-drills. These overlap on the path as the machine progresses, thus cutting away the entire surface.

The Karns machine has as its principle a large reciprocating rock-drill with a cutting-head as large as the tunnel. One type of this instrument has 41 cutters of various lengths

The points are armed with saw teeth. The head rotates slightly as the hammers strike 140 times per minute Some 2,000 cubic feet of air are consumed per minute

The Retallack and Redfield tunneling-machine is built to bore an eight-foot cylindrical tunnel It is formed with 28 percussion drills, arranged on a revolving head. In one revolution these drills cover the entire face of the heading

IT HAS COME TO BE A POPULAR SAYING IN NEW YORK THAT ALREADY MORE INHABITANTS LIVE BELOW THE GROUND THAN ABOVE IT BUT THE BUILDING OF SUBWAYS NEVER STOPS WHICH IS WHAT KEEPS GEORGE PEGRAM, CHIEF ENGINEER OF THE INTERBOROUGH RAPID TRANSIT COMPANY, WORKING NIGHTS AS WELL AS DAYS



EUROPEAN TYPE OF TUNNEL DRILL-CARRIAGE, SUCH AS WAS USED IN DRIVING THE FAMOUS LOETSCHBERG TUNNEL THROUGH THE ALPS, IN OBERLAND, SWITZERLAND

Photo by courtesy of Ingersoll Rand Company

The Singafoos tunneling-machine is practically a horizontal stamp-mill, the stamps being thrown forward by coiled springs and back by revolving cam. There are ten heads with hardened-steel faces fashioned to cut with great effect. The machine sprays the tunnel-head with water which prevents the steel from losing its temper and stops the spread of dust.

SOME OF THE WORLD'S GREATEST RAILROAD TUNNELS.

Name of Tunnel	Country	Length (feet)	Opened
SIMPLON	Switzerland-Italy	65,734	1906
ST GOTHARD	Switzerland-Italy	49,212	1882
LOETSCHBERG	Switzerland	47,685	1913
MONT CENIS	France-Italy	42,150	1871
CONTINENTAL DIVIDE	United States	33,702	(*)
ARLBERG	Austria	32,892	1885
RICKEN	Switzerland	28,230	1910
TAUERN	Austria	28,038	1909
RONCO	Italy	27,231	1888
HAUENSTEIN BASE	Switzerland	26,400	(*)
CONNAUGHT	Canada	26,400	1916
KARAWANKEN	Austria	26,196	1906
SOMPORT	France-Spain	25,656	1899
JUNGFRAU	Switzerland	23,622	1912
BORGALLO	Italy	23,220	1912
HOOSAC	United States	23,175	1876
SEVERN	England-Wales	23,028	1886
MARIANOPOLI	Sicily	22,453	1887
TURCHINO	Italy	21,150	1900
GRENCHENBERG	Switzerland	21,120	(*)
TOTLEY	England	18,690	1893
PUYMORENS	France-Spain	16,791	(*)
STANDEDGE	England	16,020	1850
WOODHEAD	England	15,879	1845
LA NERTHE	France	15,303	
KAISER WILHELM	Germany	13,767	1879
ECHARNEAUX	France	13,620	1895
BLAISY	France	13,530	—
CASCADE	United States	13,413	—
SODBURY	England	13,209	1903
CREDO	France	12,960	—
BRAMHOPE	England	11,262	1849
FESTINOG	Wales	11,171	1879
STAMPEDE	United States	9,850	
CAIRASCA	Italy	9,840	1906
BUSH IVANHOE	United States	9,394	—
HAUENSTEIN	Switzerland	8,910	—
CUMBERLAND	United States	8,000	1896
BEACON HILL	China	7,212	1910

* Under construction.

Blast to Remain.

Engineering authorities declare that while the drilling-machine has reached a remarkable state of development, it does not, for many practical reasons, mean the end of the use of the drill and blast. It is said that in extremely hard rock, dynamite will do the business much more cheaply.

On the other hand, the advocates of the pneumatic rock-drill declare that a machine, operating in New York gneiss, made an advance of more than nine feet in thirteen hours.

There is a variety of power drills. As a rule these machines are classified according to the motive-power employed. The majority are of the pneumatic type,

but hydraulic and electric drills have been used

Steam has sometimes been substituted for compressed air in surface work. There is also on the market a machine using gasoline as a motive-power.

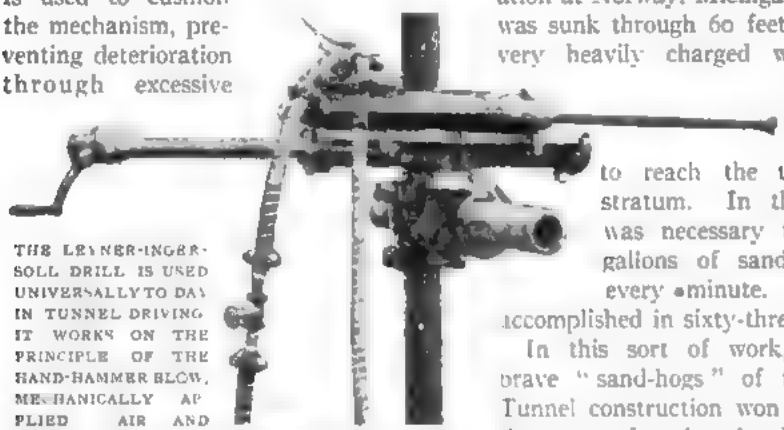
Steam is not practical for tunneling, mainly because of the difficulty in disposing of the exhaust, while the products of combustion of gasoline in a tunnel enclosure militate against machines using that fuel.

The best-known hydraulic drill is the type developed for use in the Simplon Tunnel. It is a hollow steel tube, with teeth forced against the rock by hydraulic pressure, while the tube is revolved by a water-driven motor

In one electric rock-drill the motor is mounted directly on the drill-frame, while in others the power is supplied from a distance by a flexible shaft. Compressed air is used to cushion the mechanism, preventing deterioration through excessive shock. There are numerous ingenious drills of this general type

BECAUSE OF ITS LIGHTNESS, ITS ADAPTABILITY, AND THE SPEED WITH WHICH IT CUTS AWAY THE ROCK, THE "JACKHAMER," OR HAND HAMMER DRILL, HAS BECOME VERY POPULAR IN AMERICAN TUNNELING WORK WATER AND AIR ARE FED TO ITS CUTTING-SURFACE AS IN THE LEYNER DRILL

Photo by courtesy of Ingersoll-Rand Company



THE LEYNER-INGERSOLL DRILL IS USED UNIVERSALLY TO DAY IN TUNNEL DRIVING IT WORKS ON THE PRINCIPLE OF THE HAND-HAMMER BLOW, MECHANICALLY APPLIED AIR AND WATER, BOTH UNDER PRESSURE ARE USED TO SETTLE THE DUST, CLEAN THE HOLES OF THE ROCK CUTTINGS WHILE DRILLING, AND TO KEEP THE DRILL-BIT COOL

Remarkable Feats.

Shaft-sinking in wet gravel and quicksand has often been found necessary, and has been successfully accomplished. A conspicuous instance was that of an operation at Norway, Michigan, where a shaft was sunk through 60 feet of glacial drift very heavily charged with water. A caisson, or drop-shaft, was first sunk to reach the underlying firm stratum. In the operation it was necessary to pump 1,500 gallons of sand-charged water every minute. The job was accomplished in sixty-three days

In this sort of work, certainly, the brave "sand-hogs" of the East River Tunnel construction won their honors in the pages of engineering history. In this operation two shafts were sunk to a depth of 65 feet. The material encountered was

10 feet of loam, 35 feet of boulders and gravel, and the remainder fine, fluid sand.

The work on the Aspen Tunnel on the Union Pacific Railroad, between Cheyenne and Ogden, is notable. Only 5,900 feet in length, the tunnel was extremely difficult because of the obstacles met. Great difficulty was encountered in holding back the swelling ground.

The tunnel was through carbonaceous shale containing an occasional stratum of yellow sandstone. Great quantities of water were encountered in the shaft below the level of 250 feet.

On a portion of the opening, the solid timber walls, 12 by 12 inches, would not stand the rock-pressure, and the timber was finally replaced by 12-inch I beams. Sometimes even these were buckled by the enormous weight.

Another feature of this tunnel was the use of steam-shovels, operated by compressed air, for loading cars in the headings, effecting a great saving of time and expense.

Great Sub-Surface Aqueducts.

There are hundreds, perhaps thousands, of wonderful mine-tunnels. Some of the greatest underground enterprises are for the purpose of drainage. One of the most notable of the latter is the Roosevelt Tunnel at Cripple Creek, Colorado, 15,700 feet in length. This tunnel was built through granite in less than three years, mainly by blasting. The average monthly progress was 285 feet, and the cost per foot was $27.27.

New York City, consuming half a billion gallons of water daily, received vast supplies from the Catskill Mountains, made possible by some wonderful tunneling under the land and under the Hudson River. Much of this famous aqueduct was built on the cut-and-cover system, but in many places tunnels and syphons were required.

The tunnel under the Hudson River was cut through solid rock at a distance of 1,100 feet below the surface of the river. There are thirty-one miles of tunnels, six miles of steel pipes, and fifty-five miles of cut-and-cover work on this famous aqueduct line.

Another New York City tunnel, to carry water from Hill View Reservoir, runs under the city streets and under both the Harlem and East Rivers for a distance of eighteen miles. Some of this tunnel, varying from fifteen to eleven feet in diameter, is cut through solid rock at a depth ranging from 250 to 750 feet.

The estimated cost of the tunnel was $25,000,000, and the total cost of New York's water-system, as projected, is estimated at $177,000,000.

In this work, a huge steel shield is used to drive through the mud and clay. It is propelled by hydraulic power applied to jacks which are inserted all around it. The shield is thrust forward about two feet at a time, the lining bars being inserted after each advance.

Construction Records by Railroads.

There is not much difference between railroad and mining-tunneling. Both types must be driven to line and grade; but whereas the mining-tunnel must be uniform in width and size, this is not absolutely necessary in the case of the railroad tunnel.

About the same speed may be made in both operations. Remarkable increases in rapidity of construction have been established in recent years. It took from 1858 to 1874 to build the Hoosac Tunnel, 4¾ miles, only three feet of daily progress being made. Contrast this with the record made on the Loetschberg, finished in 1911, 9.3 miles long and a very similar undertaking, where 14.2 linear feet of progress were made per day.

It is interesting, too, that the cost per foot of the Hoosac Tunnel was $398, whereas the cost of the Loetschberg was $211 per foot. The total cost of the Hoosac was $10,000,000.

The Simplon Tunnel, the largest in the world, as shown in the accompanying chart, consists of two parallel, single-track railway tunnels, 56 feet from center to

WHEN A TUNNEL IS DRIVEN UNDER A RIVER-BED AN IMMENSE SHIELD IS USED HYDRAULIC JACKS PUSH IT AHEAD, ABOUT TWO FEET AT A TIME. THE UNUSUALLY STRONG BRACING SEEN ABOVE IS NECESSARY TO RESIST THE HIGH INTERNAL PRESSURE OF THE RIVER BOTTOM AND THE WATER ABOVE. MEN CAN WORK ONLY A FEW HOURS EACH DAY UNDER SUCH PRESSURE AND MUST BE ADMITTED TO THE SHIELD THROUGH CHAMBERS IN WHICH THE PRESSURE IS RELEASED GRADUALLY

Photograph by courtesy of Flinn O'Rourke C

center, driven from Brigue, Switzerland to Iselle, Italy, a distance of 12.4 miles. Operations began at the respective terminals in 1898, and the headings met February 24, 1905, but the tunnel was not put into operation until a year later.

Brandt rotary hydraulic drills were employed on both headings. The average rate of heading advance was 15.6 feet per day, though when conditions were good as high as 21 feet were attained. The rock was chiefly gneiss.

The highest summit ever crossed by any tunnel in the world is that of the Galera Tunnel in Peru, 15,777 feet high. This passage runs a length of 9,242 feet.

To detail the wonderful feats that have been accomplished in modern times by tunneling engineers, path-finders of the world's railroads, would exceed the limit of space-allowance; but a historical review of them reveals nothing more interesting than the story told in the February issue of the RAILROAD MAN'S MAGAZINE by Mr. Max Enos, of the building of the Giant Connaught Tunnel under Mount MacDonald in British Columbia, the biggest tunnel enterprise in continental America.

Supertunnel Projected across Cascades.

Just one evidence of what the future has in store in tunneling enterprises is the projected $50,000,000 tunnel that General Henry M. Chittenden is planning to penetrate the main range of the Cascade Mountains. When this tunnel is finished it will be thirty miles long, and will be the greatest railroad tunnel in the world.

General Chittenden is one of the best-known officers of the United States Engineering Corps. He was formerly chairman of the Seattle Port Commission.

The tunnel would permit railroad traffic between Puget Sound ports and the interior. This traffic, which now has to be lifted 2,500 to 3,300 feet in crossing the range on the present railroad lines, would then pass under it at an elevation of only 1,200 feet. By these means the energy required to elevate 60,000 tons daily would be saved. Furthermore, there would be a reduction in the cost and risk involved in haulage over the steep grades of the present lines.

Also the passenger-train time would be reduced from the present three-hour schedule to forty minutes, and the time of freight-trains from ten hours to one hour and a half.

The tunnel would save 48 miles on the Great Northern Railway to Tacoma, and reduce the grade from 2.2 per cent to .06 per cent.

General Chittenden says that it would be as practical to operate this thirty-mile tunnel as it has been to operate the Simplon, twelve miles long under the Alps. It is proposed that the Cascade Tunnel operate with electric locomotives.

Other great projects in the formative stage are the driving of a big tunnel on the Pennsylvania to lower that road's main-line summit across the Alleghanies from the present elevation of about 2,000 feet, and the driving of another long tunnel by the Lackawanna or Lehigh Valley to save part of the climb from the anthracite region of the Wyoming Valley over the mountains to the markets at tidewater.

In general, tunnel construction is a most complex art of building. The engineer usually pierces the absolute unknown. He may not follow fixed laws.

In locating and surveying, good horse-sense is looked upon with as much favor as scientific knowledge. Costs are determined by the character of the material encountered.

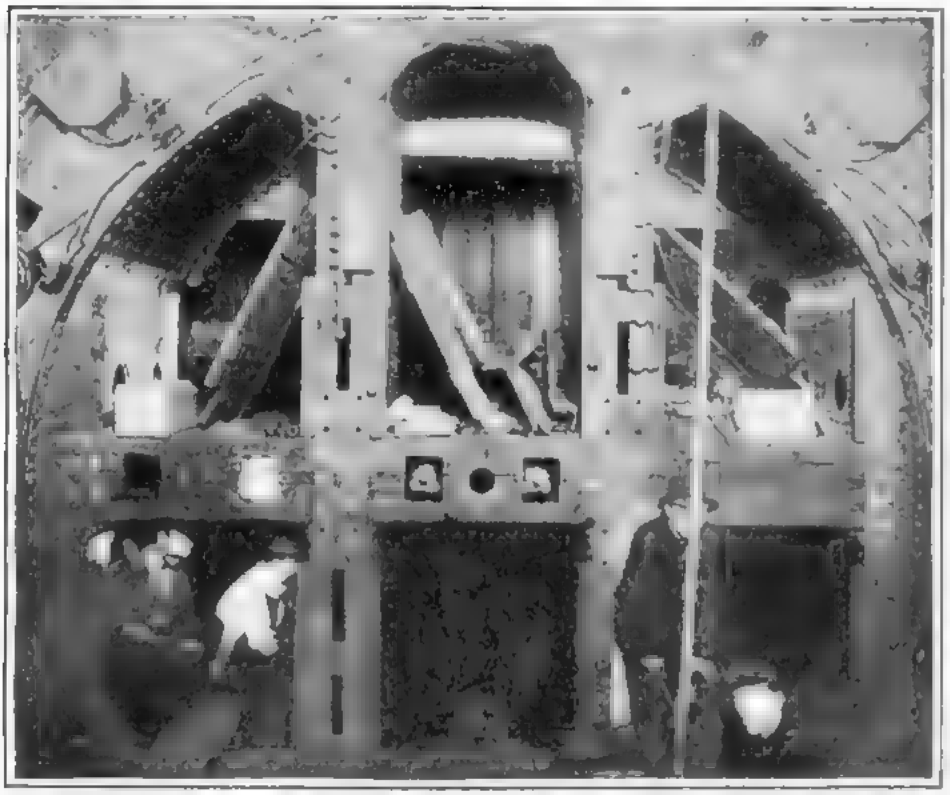
Little Tunnels Sometimes Cost Most.

There are some very short and inconspicuous railroad tunnels that have cost more than some well-known long tunnels. No man can tell just what is ahead of him when he sets his bore into the face of a mountain. Geological forecasts often are without any value. Borings alone can be depended upon.

Among the most treacherous and difficult materials encountered in tunneling are: Laminated, wet clay, which often exerts tremendous pressure by swelling; shales which swell, and small, loose sand or gravel, running like fluid. All these materials demand the most difficult timbering work. Then there is a variety of hard rocks and boulder difficulties.

There has been a vast loss of life in modern tunnel-building from two chief causes. First, careless use of explosives; second, careless inspection of the tunnel after blasting. Unless the walls and roof of the tunnel are carefully scrutinized, loose rock may remain hanging undiscovered, later to fall upon the gangs without warning.

FIVE INGERSOLL-RAND ROCK-DRILLS ARE MOUNTED ON COLUMNS IN HEADING OF THE LOOKOUT MOUNTAIN TUNNEL AND SET TO WORK—"TRIMMING"



AN INTERESTING FEATURE OF THIS REAR VIEW OF THE RIVER-TUNNEL SHIELD IS THE IRON PARTITION (IN THE BACKGROUND) WHICH MAKES THE SHIELD AIR-TIGHT. A TREMENDOUS AIR PRESSURE IS EXERTED FROM BEHIND TO HOLD BACK THE WATER AND MUD. THE RINGS WHICH LINE THE TUNNEL ARE ERECTED AFTER THE FORWARD THRUST OF THE SHIELD

It is said that tunnel-workers sometimes become so familiar with the dangers of their trade that they have contempt even for the potency of dynamite, and there are instances of men who make a practise of throwing sticks of this explosive to each other to save steps.

However, sooner or later, a man misses the catch and there is instant death, not only for the triflers, but for innocent companions.

Underground Forces.

The great undertaking of driving the St. Gothard Tunnel, which is 48,887 feet long, ranks high in the history of the art. For the most part the tunnel penetrated various sorts of schist.

One of the headings passed through a zone of softened feldspar, which, under the weight of rock, squeezed into the opening with such terrific force that arches of granite, six feet by seven inches in thickness, were required to hold it.

The third highest railroad tunnel in the world is the Busk-Ivanhoe, on the Colorado Midland Railroad, between Leadville and Glenwood Springs. It is 9,394 feet in length, and has an altitude of 10,810 feet at Busk and 10,944 feet at Ivanhoe.

Almost the entire distance it was carried through granite. It was very difficult to build, and thirty men lost their lives before the tunnel was opened.

On account of the great quantity of water that ran from springs into the Severn Tunnel while under construction, on the Great Western Railway in England, it was necessary to construct an immense pumping-plant with a capacity of 45,000 gallons per minute.

A Gopher City.

New York City is the chief example of how concentrated population forces man to gopher habits. There are hundreds of thousands of men and women workers in the metropolis who travel from home to office every day, perhaps a journey of twenty miles or more, and are off the surface of the land and away from the sunlight and open air all of the time except for the few blocks they may have to walk from their homes to the subway or river-tunnel entrances.

One may live an extremely active life in the great city, performing the functions of business and social interest, and week on week never step upon the open street. The city man may go directly from his hotel apartment into the subway, reaching his office through underground passages, dine underground, do his shopping in stores with subway connections, enter his club by a subway passage, and by walking less than twenty feet under the original dome of heaven, pass into either church or theater.

The next five years are to bring forth in New York a wonderfully increased use of subways and tunnels, setting an example for the other great cities of this country and the world.

At the present time the tunneling in or near the nation's chief city may be summed up as follows:

New York Tunnels.

Pennsylvania Railroad, under Hudson River; built between 1904 and 1910. Two tubes of cast-iron rings, 23 feet outside diameter. Subaqueous portion 6,118 feet long.

Joined to this are the Manhattan cross-town tunnels, making continuous tunnel traffic from Weehawken, New Jersey, to First Avenue in Manhattan.

The crown of the latter tunnel is about 60 feet below the street surface. At first Avenue this tunnel joins with the East River Tunnels, under the East River to Long Island City. Subaqueous portion about 3,900 feet.

Hudson and Manhattan Railroad system. North tunnels under Hudson River from Jersey City to Morton Street, New York. Opened 1908. Begun 1874. There are two tubes 3,900 feet long, 15 feet 3 inches in diameter. Connects with "up-town tunnel" from Morton Street to Thirty-Third Street.

South Tunnels, under Hudson River,

from Jersey City to Church Street, Manhattan. Two tubes about 5,950 feet long, 16 feet 7 inches outside diameter, of cast-iron rings. Built between 1905 and 1909.

Two single-track tubes from Hoboken, New Jersey, terminal of the Delaware, Lackawanna and Western Railroad to Washington Street, Jersey City, with connection with North Tunnels and to the Erie Railroad Station. Branch also to Pennsylvania Station, Jersey City, connecting with South Tunnels. Built between 1906 and 1911.

Belmont Tunnel, under East River from Forty-Second Street, Manhattan, to Long Island City. Subaqueous portion, two single-track tubes with cast-iron rings 16 feet 10 inches in diameter. Horseshoe shape through solid rock, and elsewhere a rectangular, double-track cross-section with reenforced-concrete lining. Built between 1905 and 1909.

Rapid Transit Tunnel, under East River from Manhattan to Brooklyn, connecting the New York and Brooklyn subways. Two tubes 6,784 feet long, inside measurement 15 feet 6 inches. Built between 1903 and 1908.

Bergen Cut, Erie Railroad, through Bergen Hill, Jersey City. Built between 1906 and 1910, with five four-track tunnels, 4,300 feet long; at bottom 58 feet wide and 21 feet high.

Lackawanna Railroad Tunnel, through Bergen Hill, Jersey City; 4,283 feet long, 30 feet wide, and 21 feet high. Built between 1906 and 1909.

Under construction are three great subways under the East River to connect the new subway system of Manhattan with that of Brooklyn.

A considerable portion of the New York subway system is actual tunneling, as distinguished from the subway cut.

The total length of the subway system operated by the Interborough Rapid Transit Company is 26.3 miles. It is 54 feet 8½ inches wide, and 16 feet 7 inches high. Total cost about $75,000,000, including equipment.

More Coming.

About forty-five miles of additional subway has been contracted for by the city of New York. Some of these new subways are nearing completion. The cost of building and equipping this gigantic system will be about $352,000,000.

Extensive tunneling and subway-building in New York has been planned by the New York Central system, which now operates the famous Park Avenue Tunnel through the heart of Manhattan.

It is a long reach from the tunnel activities of the slaves under Rameses II to the scientific builders of this day; but the future promises to make of this art an enterprise of stupendous value. In the crowded cities the tunnel enterprises of New York are to be duplicated.

In the metropolis there will be tunnels under tunnels in the main arteries of traffic. On railroads the tendency will be more and more to cut under the barriers of the direct routes. Tunnels under rivers will replace many bridges.

Insatiable man makes his demands; brain and brawn respond.

THE CAR ACCOUNTANT SAYS:

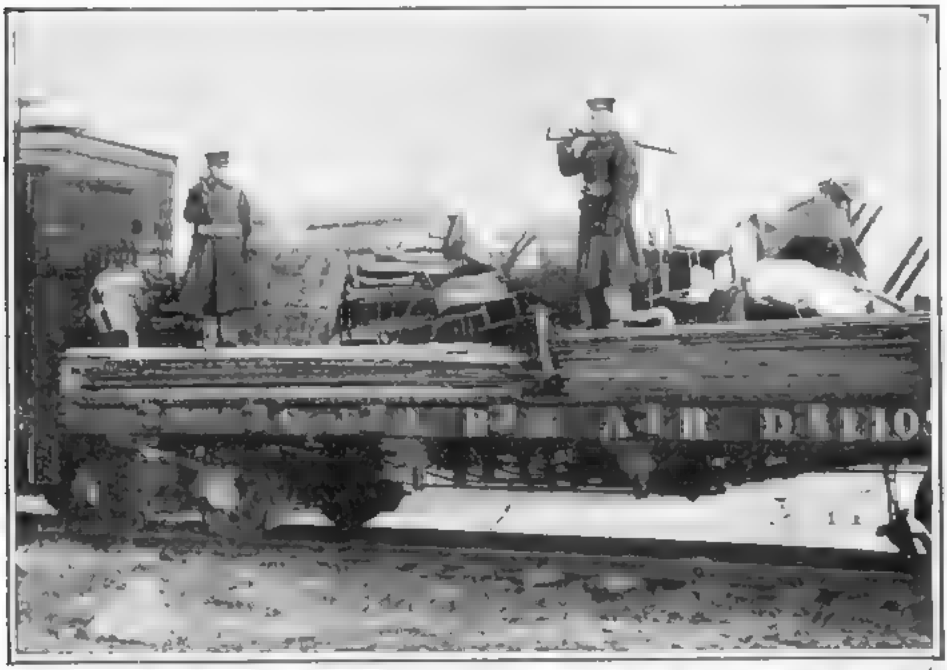
I KNEW a checker who could remember the numbers of a string of cars a mile long, but not the size of his own hat.

FROM THE RAILROAD MAN'S MAGAZINE.

U. S. GIVES GERMANS R. R. RIDE.

WHEN THE ORDER CAME IN MARCH TO INTERN 750 GERMAN SAILORS, THEIR BELONGINGS WERE PLACED IN FREIGHT CARS ON WHICH WERE TACKED PLACARDS READING 'URGENT DELIVERY FOR GOVERNMENT DO NOT DELAY THIS CAR" UNDERNEATH THIS ON EACH CAR THE GERMANS CHALKED THE NAME OF THE SHIP FROM WHICH THE EFFECTS HAD BEEN REMOVED

From a copyrighted photograph by Underwood & Underwood, New York



THIS PARTICULAR INTERNMENT ORDER AFFECTED CREWS AND OFFICERS OF THE GERMAN GOVERNMENT'S SHIPS KRONPRINZ WILHELM AND PRINZ EITEL FRIEDRICH, WHICH HAVE BEEN INTERNED AT THE PHILADELPHIA NAVY YARD SINCE OCTOBER, 1916 THE MEN WERE REMOVED TO DETENTION CAMPS AT FORTS MacPHERSON AND OGLETHORPE, GEORGIA MARINES ARE HERE SHOWN GUARDING THOSE POSSESSIONS OF THE GERMANS WHICH IT WAS NOT PRACTICABLE TO LOCK UP IN BOX CARS

From a copyrighted photograph by Underwood & Underwood, New York

MALONE ON THE INTERURBAN.

BY JOHN C. RUSSELL.

His Brief Experience with a Juice-omotive Is A Tale of Wo as Long as a Piece of String.

SPIKE had been out of our midst for some moons, and I had missed my roommate more than I cared to admit; so when he came bulging into the room late one evening we fell into each other's arms with a racket that brought the rest of the gang madly stampeding to see what had broken loose. After we had ejected them and settled down before our open fire with our pipes going good Spike commenced to chuckle.

Rusty! (said he). Isn't a railroad man the blamedest critter you-all ever had under observation? How so? Do you-all ever cherish the notion that you ever succeed in prying a real, shore-'nough rail away from where he can hear the stack barking or the wheels under the little red dog-house behind the train counting off the rail-joints?

Forget it! Noways possible! If I have tried this said break-away stunt once, I have embarked thereon times without count, only to hunt my home-ranch like a stray cayusé; and this last razzle-dazzle of mine shorely caps an otherwise well-decorated climax.

I've done had a large plenty!

What have I done?

Listen and lemme unfold a tale of wo as long as a piece of string, and if you-all don't rise and inform me I'm a wise *hombre* when I declare that I'm plumb overjoyed to get back into the harness again, I'll shorely deem you a mental cripple nothing short of idiotic!

You all recall when I lay off here a piece back, pack my turkey, and silently slope for parts unknown? Right then and there I proceed to breed a scab on the end of my nose. I emerge forth from this latest episode with a firm conviction that what I don't know about things is a colossal plenty.

I don't have any fixed notion of where I'm going, nor why; I only have a bad case of itching feet, and distance is the only cure for that disease that I wot of at the time; so I surge hither and yon over this broad land of ours until my financial resources are just about *nil.*

This melancholy condition hits me in that Utah burg called Mountain, and right here I rise to remark that this here town is a heap too unsympathetic for your little friend Spike. All the various species of hobo what travel this broad land make that town a port of call, and the good citizens thereof are case-hardened to hard-luck yarns to a degree that renders them simply impervious thereto.

So I have to go to work, and that right speedily. I hits up the Short Line, the U. P., and the Rio Grande in rapid and unsuccessful succession, business being at an ebb, and finally gather the conviction that there's nothing in that town for a poor rail.

I'm about to blow when a friend of mine puts me hep that the Old Lady's Institute, which is the characterization duly accorded an electric road running out of this burg, is on the hire, and that ex rails with a clean nose, clearance

speaking, can land a job of wages thereon. So I mope into the sanctified office of the head whoozis of the concern and lay my clearance before him with a heart-felt plea for a little work. He hires me, and I got it; believe me, friend and brother, what I asked for was *just* what I got—work!

First off I get deluded into confessing that I don't sabe anything about this proposition of burning juice, and so they confine me in the car-shops so I can roam around in the internal arrangements of these big suburban cars with a trusted guide, counselor, and friend, and pick up the why-for thereof.

I learn a mighty lot the week I'm pestering around these cars; one lesson enduring which I make positive is indelibly engraved on the tablets of my mind. Me and Skinny, who is the genius that is instructed to instruct me in the inner mysteries, are playfully taking apart the gadgets under the bosom of this car, the same being designate as a control-box, and Skinny, pointing to a bunch of cast-iron grids, tells me they're hot.

Without an instant's hesitation I reach forth to see how hot these grids have become, not previously noticing any heat thereabouts, and before Skinny has time to emit a yell of warning I lay my hand thereon, and immediately get a new definition of what " hot " is.

Gentlemen, hush! The world turned over three times and the moon exploded! To say I'm astonished most to death puts her mildly.

I learn subsequently that when these juice-bugs say something is hot they're lying; they seek thereby to convey the information that said article is imbued of a mighty potent devil with a kick like Maud; that it's loaded; full of stingaree; that instead of being hot like a civilized person declaims, it's just potential battle, murder, and sudden death!

They tell me I'm lucky, because they're on the city current, which is only six hundred volts, instead of on the fifteen hundred they employ in the rural districts. At that I don't sabe their definition of lucky. If what I got then was luck, I'd hate to get real prosperous!

Eventually I get promoted to riding over the road with a real, shore-'nough motorneer, and right then my real thrills commence. Rusty, this system I debouch on extends some ninety miles up into the wilds of Idaho and back again; and those fellows double that stretch for some two and one-half bucks! I make student trips until I'm black in the face, and then they pronounce me a full-fledged member of the juice-jerkers, mark me up on the extra board, award me a shiny, new tin badge and a couple of keys, and tell me I'm elected.

Oh, joy! At last I'm to be trusted with as many as one cars all at once to run all of that ninety miles, and may God have mercy on my soul! I'm impressed.

But, all joking aside, it's a real privilege to sit out there in the little compartment all to your lonesome and turn her on and off. No fireboy to cuss with; no water or steam to watch; no oiling round. Just *click-click-click!* on the controller and you're off.

They have the good taste to equip these cars with the good old Westinghouse air, and I'm so confident that I have the stoppage where I want it all the time.

But take it from me, who knows, the other things are different.

First off I wants to impress on you that Mr. Whoozis, the grand wheeze of this pike, is a street-car graduate; but he goes to most unnecessary pains to impress on me that he is running a real, honest-to-goodness railroad; that all things are done decently and in order as per the A. R. A., their book of rules, and before they trust me out on the pike they haul me up for an examination.

Most severe it were. All about what is a clearance, and what is the difference between a 31 and a 19, and why is a trainmaster, and who is boss, and a lot more junk, until I deem I'm getting onto

a plant that requires the game played according to Hoyle *à la* the U. P., and that is about the limit.

So when they send me out to act as conductor of a work-train up the valley some fifty miles, instead of a motorneer, as which I hires, a low, sneaking feeling of distrust steals over me.

My experience next morning is a corker. I awake bright and early some twenty minutes late, and bustle down to the depot hunting for an operator. Nix on the op. Finally up blows Swede Johnson, who is a motorneer, and from him I extract the information that I have to take the phone set from outen the car, plug in on a phone jack handy thereabouts, and call up the train-delayer for orders and instructions.

This same I do. I report Malone at Logan with the work-train and ask for orders. Mr. Despatcher says, "Copy 3." "Gee," says I to myself, "that sounds like business."

Then:

> Order No. 3 C and M Extra 504 at Logan.
>
> Extra 504 will work between Logan and Dewey, protecting against two extras.

Then come the super's initials. I don't get this very strong.

"What two extras?" I demand.

"Why, I don't know what they will be yet," says my friend with the brass collar. "There isn't anybody out at the car-barn here yet, and Preston hasn't called up, so I don't know what their number will be."

"Well, what are they?"

"Both work-extras."

"Where are they going to work?"

"The roadmaster didn't say yet."

"Well, suffering cylinders! Do you-all want me to go out on the main line against those two birds, and not know anything about them, and yet you desire me to work between two points some thirty miles asunder? What kind of protection are you-all going to give me? How do I know I won't go bulging around a curve or through a cut and slam into one of them?"

"Oh! That's all right," says this train-destructor. "I'll tell them to look out for you somewhere. You call me up from time to time. We do that here right along!"

I near faint.

"Well, gimme a clearance, and I'll be just as devilish as you-all," says little Spike.

"Clearance?" asks this walloper. "Clearance? What for?"

And right there I hang up and depart in a misty daze that doesn't leave me for hours and hours. It all seemed so dad-blamed casual like!

Then figure that these stingaree cars go buzzing along the face of nature at some stealthy pace of seventy miles per, and look at it from that angle, too! Also, that this pike has some twenty miles odd of two per cent hill, with curves and cuts that would make the Rio Grande look sick; and right there is where I'm elected to do my work and look it over again! Whoooosh!

But the other guys don't seem to see anything unusual in the layout, because when I give this Johnson the tissues and stand by, looking for a fit from him, I reap another shock. He looks them over most professional, cocks a blond eye at me, and says:

"Lemme out on the main and we'll go."

"Go where?" I demand.

"Oh, until we meet one of these fellows!" says he, just like that!

And away we go, just like Safety First All the Way!

Later I learn that this is nothing out of the usual, and that I'm lucky to get broken in on something as easy as that. Lemme tell you about the trip that writes finish to an otherwise bright career for Spike.

If you-all deem, from a casual perusal of various literature, that this juice-roading is all cream and roses, listen unto me! I'm fairly familiar with the assorted

do-funnies that a steam bulligine can dig up on the spur of the moment to make life unmonotonous for the hogger; but lemme warble into your shell-like ear that a juice-'gine can give 'em cards and spades for the playful perpetration of mischief. They're nothing short of a he-steamboat when it comes to pulling off the fancy and unexpected.

I have circused about for a few trips and begin to deem myself a motorneer on the passenger-cars, when they unload me onto a freight-locomotive, and then the real diversions set in. Up in Preston, one mild and bright afternoon, the agent —who is also the call-boy, baggage-smasher, operator, ticket-agent, janitor, and grief man for the company—calls me for the freight-locomotive south at 6 P.M. in the evening, this road running its local all in the black.

Now I have been up in this loco before and speculated mildly on the many do-flickers wherewith she is plentifully decorated; but as to the real utilarian purpose thereof I'm three sheets in the wind. I do know where the controller, or throttle, and the reverse-lever are located; and as she is equipped with the ET air, I'm more or less familiar with her brake system; but that doesn't begin to plumb her possibilities. Not by a jugful!

To begin with, she is a double-ended arrangement with two of everything stuck on her; and while this provides plenty, it also breeds confusion, as some of the control for one end is plastered on the other, and *vice versa*. I know that sounds mixed, but that's the way she was—mixed. And that is the prezact way I feel when I swarm up into her cab and begin to look the layout over.

The car-wrastler in the barn elects to shed illumination on my ignorance, but beyond divesting himself of a mess of long and shaky words he doesn't engender any ideas in my bosom. This juice seems to have that failing.

Ask anybody that ever works around it about something, and you get a mighty plenty of mouth-filling and jaw-fracturing words that, when you come right down to sift out, leave you the information that so and so is thus because somebody said so, and there you are!

You know me, Al! I never see the proposition I wouldn't try one whirl anyhow just for luck; so the way I go about this job you shorely pass judgment that I'm born with an electrode in my mouth and raised exclusively on currents!

Between experimenting and cussing I finally dope out where is the end I'm to work and get enough of the apparatus located to start, stop, and back up with. This is mighty Jake, and I denounce myself as ready to leave town when required. They back me onto some three freight-cars and highball me out of town —and the festivities ensue!

Man, if ever I cuss a road, the language I expend on this pike at and enduring the time I negotiate this trip is a miracle. I soar into the realms of the sublime.

In the first place, they deem it a mighty cute notion from the standpoint of economy to have all stub sidings—switch at one end and a pile of dirt at the other, dirt being much cheaper than another switch and set of frogs, you know—and this leads to complications.

Of course it's my luck that we have to pick up cars out of every switch that is setting the wrong way for us, and what set-outs we have later on develop the same peculiarity. It's a case of fly them in and pole 'em out every time.

And, Rusty, I sabe a heap of diversions more edifying than trying to pole a car out of a stubby switch or make a drop of one into a hole with this juice-omotive. First time I try her I sure gummed the works. Man, it was a riot!

Tommy Thompson, who was the brains on this trip, was an old rail with whom I had previously had many haps. At this station where we have one to pick up he comes over ahead, pulls the pin, and motions me down the main until we stop side-by-each with a box car.

Next thing I know he has searched

forth a pole about as long as from here to there, and, easing one end up against the car, he hands me an "easy-ahead" token.

Now there isn't a whole heap of flexibility to this motive power; you either go or you don't. At least, that's how a new man finds it. Your slow is too slow and your fast is too fast for tender work like that—that is, if you're used to doing the work with steam—so I slope up as easy as I dared until I butt into the pushee end of the pole, and then I widened on her with surprising results.

As I yanked her wide open, with one fell swoop comes an explosion like a forty-two centimeter, much exhibition of fireworks, and a most heinous smoke and smell; and we cease abruptly all further progress. Pretty soon I come back from across the ditch, where I elope with vague notions of a dropped crownsheet, to find Tommy projecting around in her vitals with a lantern

"What the triple decocted extract of condemnation has transpired, and why?" I demand.

"Circuit-breaker," says Tawm, unconcerned as Punch. "You must have hauled her all the way back at once," says he.

"Of course I did," I declaim with some heat. "How else am I to impart violent forward motion to that rattler you desire outen this track?"

"You-all mustn't do that," says Tom. "You have got to feed these goats up gradual, Spike, or they'll kick out on you every time. Feed her gradual."

He shows me the circuit-breaker and the reset, and explains the how and the why thereof, and we proceeds to horn that car out without further diffyoucalty.

But right there is engendered the seed of distrust in my breast, and I don't feel so brash about this he-monster as I did a piece back.

We get our train together after a fashion and spin merrily on our way. Nothing transpiring out of the ordinary, I'm beginning to feel better about it and allow that it's a fair job after all, when the lights go out in the cab and the most appalling demonstration of lightning without any thunder I ever witness takes hap.

I slam the breeze under her and slant down to a stop, the cab lights flashing up and going out in a most mysterious manner. When we pause I uncovers the seed of this transaction; we have lost the trolley wheel. Not having another, I have to hike back some hundred rods and inculcate a still hunt for the one we lately sports, find same, and, hauling down that stinger-pole, affix its little wheel thereonto.

Some job, especially as I didn't have any confidence but what the walloper would sneak up and lambaste me over the head with a volt or so while I was so doing.

Next stunt happens while I'm switching. We head in on a lead of sorts, and if I have to stop once to change the trolley while I'm doing a little piece of switching I have to do that same ninety times. We horn in onto one track and go merrily warbling along thereon; comes a darkness abroad on the land.

What happens? Simply because we have elected to go in on one track is no criterion of which track the trolley blithely chooses to roam! No chance that the trolley and the train should think alike about the proper way to go!

Every time that we go one way the pole goes the other until it can't reach the wire and the 'gine at the same time, and so, parting company with the wire, to an accompanying lurid display, it robs us of our juice and we have to persuade it in its proper path.

But listen! Once we *back up* and have a difference of opinion! You-all can imagine what transpires!

This pole isn't constructed so it can do hand-springs on top of the roof of the cab, and so when it jumps the wire backing out, we proceeds to give a first-class little imitation of destruction! When I

get wise to what is happening and why, and get the devil stopped, we have tore down and wrapped around the pole all the loose and available trolley-wire in sight.

I start, cussing, for the roof of the cab to tear same loose, when Tommy shouts a warning:

"Look out, Spike, that's hot!"

And this word hot recalls me to my senses with such vividness that I don't even wait to stop; I stop and come down off the top of that cab all in one motion, believe me! And there we laid until they routed out the wire gang, "wiremen," "squeaks," "grunts," and all the rest of the crew, and proceeded to unpuzzle us.

And once more we set forth on our pilgrimage!

But the banner stunt of the whole trip happens at the next town. And there, and there only, did I come to my senses complete, and the way I left those parts was nothing short of a whiz. Before leaving the burg where I'd performed the cocoon trick with the pole and trolley-wire, I get an order saying we would meet extra 802 north, the north-bound local, at Big Water, which was only ten miles from Mountain.

Well, sir, we took that string of rattlers up the summit and down the other side; switched two hours setting out one and picking up two, on some more of those condemned, one-ended sidings, and hiked merrily forth.

All went as merrily as a funeral bell until I come plowing in at about 4 o.x. in the cold, gray dawning, dog-tired, mad, and hungry in the bargain. We switched and switched and hump-backed freight until the cows came home, and the more I worked the madder I got.

Finally, as all things must do, we got our work done and tied our string together. I was beginning to feel a fatherly interest in that string of cars, I had been with them so long!

Now there is a deucedly sharp curve just south of the station about fifty feet; and then on, up through the city, the road ran up about a three per cent grade that was considered a bad one. 'Twas some feat to take ten loads and empties up there with the juice-'gine, and you had to get a swing on them that would last quite a way.

Which is what I proceeded to do! I backed the train down about a quarter of a mile, because I was mad enough to take a chance on trying to put them all over in one bundle, and tired enough to dislike exceedingly the notion of doubling; and the way we set sail for that curve and hill was a straight caution.

I popped into the curve going about twenty miles per, which was flying, and as soon as we got the head and fairly around I look up the hill, and nearly threw a fit then and there!

Here's a headlight, big as life and twice as natural, coming down!

I slammed the air under them, search forth a red fussee, and hit the ground on a high run because I know that whoever was coming down was *coming*, and that he would want space to stop in and plenty of it. At the same time Tommy grabs the reverse-lever, heaves her into the back motion, hands her the juice, and—*the walloper refused to budge at all!*

What? *I* don't know! Never found out!

This inhuman, doddering, decrepit, greasy head mechanic of the derelict junk-heap that was coming down the hill didn't know, either. At any rate, he put her into the big hole and sloped off into the friendly lawn alongside, and the two extras had met!

I make a run for this *hombre* with blood in my eye.

"What the minutely particularized blazes are *you* doing out here on the main line?" I vociferate. "I had an order to meet you at Big Water! How in thunder did you-all get here?"

He looked up at me from where he was sitting on the ground.

"The despatcher told me to go ahead; he thought I would have time to make here before you got in!" said he.

Can you beat that?

.

There is a railroad running close by where the despatcher put us together. The station is about a mile out of town, west. In the stillness of early dawn I could hear an engine, *not* electric, snorting about in the yard. Says I to my fluttering heart-strings:

"Peace; be still!"

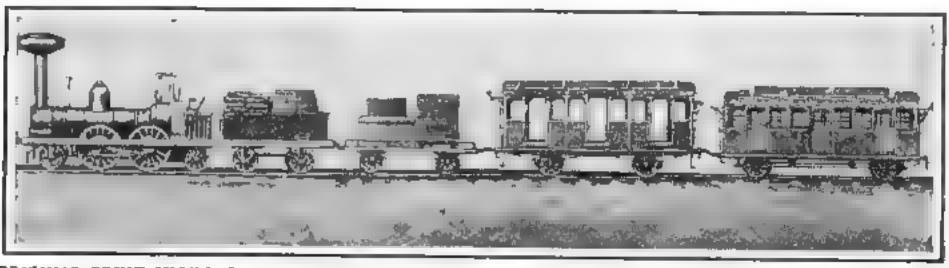
I looked at the pile-up of juice-junk and the expression on the face of the victim beside me; and I don't blame the engineer, *not* motorneer, on that Short Line local there in Brigham yards for batting me over the head with a Stilson wrench for trying to kiss him about five-fifths of a second later on!

After I had explained to him, as we rolled on into Ogden on a real locomotive, on a real railroad, with a real train behind us, and a real despatcher signing the tissues, he forgave me.

But, Rusty, believe me, it was mighty fine music to lean my head out of the dirty, grimy, greasy old cab-window and listen to that mill talk in a language I could understand!

So here I am; back!

CANADA'S FIRST R. R. TRAIN.



ORIGINAL PRINT SHOWING THE BEGINNING OF RAIL TRANSPORTATION IN CANADA. THIS TRAIN MADE ITS FIRST RUN IN 1836 OVER A SIXTEEN-MILE TRACK, CONNECTING LA PRAIRIE AND ST JOHNS, PROVINCE OF QUEBEC.

THIS antiquated drag inaugurated Canada's railroad service. In the year 1836 the Dominion's first railway company, the Champlain and St. Lawrence Railroad, now a part of the Grand Trunk system, commenced operations with the above equipment. This was seven years after the first railroad in the United States started.

The original route of this line was from La Prairie to St. Johns, Province of Quebec, a distance of about sixteen miles. The locomotive, with its queer-looking stack, was christened the Dorchester.

Note the tiny tender, containing a neatly piled supply of fuel and a barrel of water, while behind it rolls an unenclosed freight-car with three pieces aboard, followed by two passenger-cars modeled so closely upon the old-fashioned stage-coach that each even has what appears to be a driver's footrest in front and tally-ho seat in the rear.

Contrasting the big mileage of the combined Canadian railroads to-day, which is approximately 27,000 miles, it will be readily seen that railway construction has proceeded briskly since the old Dorchester wheezed her way over a sixteen-mile main line. There are no available figures giving the volume of traffic in the earlier days of Canadian railroading, but it must have been small indeed. To-day over a billion and a half dollars are invested in the steel highways of the Dominion, and the yearly total of passengers carried runs to over forty million persons.

FROGS.

New type of improved dining-car costs $30,000.

No passenger was killed by the Southern Pacific last year.

Coal to cost railroads $130,000,000 more this year than last.

New D., L. and W. passenger station at Buffalo cost $3,000,000.

Americans have obtained a franchise to build a subway in Petrograd.

Street railway at Windsor, Ontario, advertised for women conductors.

Great Western Railway, of England, was 7-foot gage clear up to 1892.

Sixty per cent of the persons killed by railroads in Illinois were trespassers.

Road trainmen were paid the neat sum of $279,896,000 in wages last year.

Waste paper picked up on Pennsylvania lines is worth $22,500 per annum.

Railroad men from South Africa are now aiding France to keep her roads running.

Burlington system consists of some 225 small roads; Rock Island includes about 100.

Fifty thousand employees of Western Union granted an eight-hour day beginning May 1.

Derailments cause more deaths and injuries to both passengers and trainmen than collisions.

Clarence H. Mackay, Postal Telegraph head, presented government with 500-bed hospital base.

Passengers carrying sixty-ride commutation tickets on the Long Island Railroad number about 24,000.

Wire and traction companies of the United States purchased no less than 4,077,964 poles in 1915.

Colonel Walter Katte, pioneer railroader and builder of New York Elevated lines, is dead at 86 years.

Chicago and Northwestern, during past four years, has carried 132,238,957 passengers without a fatality.

Twenty thousand messenger boys, it is expected, will be in training-camps around New York this summer.

Postmaster-General Burleson has asked government to cut the amount it pays the railroads for carrying the mails.

One-half of all trainmen are in the East, about one-third in the West, and the remaining sixth in the South.

A telegraph company has a messenger "boy" in its office at Pittsburgh, Pennsylvania, who is seventy-two years old.

Delaware and Hudson plans to set out 1,250,000 trees this year along its right-of-way near Loon Lake, in northern New York.

At dangerous crossings in California "thank-you-ma'ams" are built in the road to remind autoists to stop, look, and listen.

Great Northern will electrify 300 miles of main line between Spokane and Seattle, because of mountain grades and heavy traffic.

Ravages of war have piled up 150,000 tons of scrap iron on Mexican railroads, the same now being sold in the United States.

Chesapeake and Ohio runs two special "booze trains" from "wet" to "dry" territory in West Virginia, complying with new laws.

One hundred thousand dollars in gold and silver coins spills all over Adams Express Company storeroom, and not a cent is hooked.

Law in Mexico prohibits railroad employees striking in a body, so they now strike in small groups at a time until everybody is out.

Long Island Railroad has a correspondence school to teach employees elementary mathematics, electricity, stenography, and railroad operation.

Persons killed on United States railroads in 1915 numbered 8,621, injured 162,040; in year 1907 number killed 11,839, injured 111,061.

A gold medal to A. E. Barker, stationmaster of the Oregon Short Line, at Salt Lake City, Utah, because he has the best kept station on the line.

Average yearly railroad wages: In Russia, $211.40; in Germany, $408.79; in Japan, $112.56; in Canada, $647.91; in United States, $756.83.

Uncle Sam has purchased and will operate the Manila Railway, in the Philippines. E. E. Reed, a former Congressman, is the new president.

Adams Express messenger was robbed of $10,000 in Tarentum, Pennsylvania; within one week the robbers were caught, tried, convicted, and sent up.

Ten-hour through trains between Boston and Washington, *via* New York and Philadelphia, are now the regular thing; average speed, 46 miles an hour.

Pennsylvania Railroad employees saved $14,000,000 worth of the company's property from fire in 1916 by systematic methods of extinguishing small blazes.

Messenger girls tried out in New Brunswick, New Jersey. One was told to "hustle along" a ten-word message, and hired a taxi which cost company $1.50.

In 1916 the railroads "took in" $3,370,789,396 cash, and paid out in taxes and operating expense $2,349,758,852, giving them 30.29 per cent net operating income.

Hell Gate Bridge, longest steel-arch bridge in the world, is now open. It has a span of 1,017 feet between faces of opposite towers, took four years to build, and cost $27,000,000.

Envelopes apparently intended to resemble those used in the transmission of telegraph messages, but which contain only ordinary letter or circular matter, are no longer mailable.

If you call Central a "bum," or tell her you hope she "busts a leg," the company can take out your phone and forbid you from using any one else's, according to the New York Public Service Commission.

Operator Walsh, Marconi Wireless Station at Honolulu, Hawaii, recently sent 67 messages to California in eighty minutes, the shortest message being fifteen words. Operator Barsby copied them without break or error.

RAILS EARN BILLION A YEAR.

Over 1,400,000 Employees of American Steam Carriers—Pay Has Increased Almost $325,000,000 a Year in Decade.

HOW big is the railroad family and how does it fare?

New statistics show that the number of people who live from the contents of railroad pay-envelopes is now in excess of a million and a half.

The exact number in 1915, which is the latest compilation, but which includes only the railroads with annual operating revenues above $100,000, is 1,409,342.

Say — if the dinner-horn would blow for that family, and every member of it should come in at the same time for a seat at the table, the festal board, allowing three feet to a man, would reach from New York to Grand Rapids, Michigan, if they sat at only one side of the table.

Considering averages of year-in-and-year-out "going," and size of the industry, railroad men are among the highest-paid wage-earners in the world. The aggregate annual compensation of employees in the United States for the year 1915, on railroads with revenues in excess of $100,000 per annum, is stated as $1,164,844,430. That's a lot of money. If it were in gold dollars it would weigh more than five million pounds.

According to the new reports of the Bureau of Railway Economics, covering the larger railroad statistics from 1905 to 1915, the aggregate annual compensation of employees has increased in ten years $324,899,750 per annum.

Readers of this magazine will find much interest in the accompanying charts.

It must be explained, however, that the figures in these charts are not final, as they include only those roads with operating revenues in excess of $100,000 per annum; and also there are left out of the tabulation the figures of several large carriers who failed to supply data.

I—AVERAGE ANNUAL COMPENSATION OF EMPLOYEES: U S, 1915

Class of employee.	Average number of employees.	Aggregate annual compensation.	Average annual compensation.
General officers, $3,000 per annum and upward	3,748	$23,594,499	$6,295.22
General officers, below $3,000 per annum	3,330	5,432,211	1,631 29
Division officers, $3,000 per annum and upward	1,027	3,864,445	3,762 85
Division officers, below $3,000 per annum	7,645	13,317,692	1,742 01
Clerks, $900 per annum and upward	54,225	61,438,136	1,133.02
Clerks, below $900 per annum	80,845	58,260,023	648.45
Messengers and attendants	8,131	3,517,203	431 96
Assistant engineers and draftsmen	7,144	7,962,456	1,114.57
M, W. and S. foremen	6,171	6,818,753	1,104 97
Section foremen	37,356	28,630,529	766 66
General foremen, M. E. Department	1,486	2,266,007	1,524 90
Gang and other foremen, M. E. Department	14,205	16,550,327	1,165.11
Machinists	32,072	33,952,245	1,020 73
Boiler makers	10,739	11,537,225	1,074 33
Blacksmiths	6,078	6,447,608	924.00
Masons and bricklayers	1,075	847,640	788 51
Structural iron workers	780	705,029	893 57
Carpenters	43,361	33,212,781	765.96
Painters and upholsterers	8,761	6,624,153	756.10
Electricians	5,559	5,226,550	940.20
Air-brake men	4,781	3,875,022	810.50
Car inspectors	16,315	14,416,662	883 64
Car repairers	53,366	39,948,311	748 57

Class of employee.	Average number of employees.	Aggregate annual compensation.	Average annual compensation.
Other skilled labor	41,806	$35,688,804	$853.68
Mechanics' helpers and apprentices	64,356	38,040,818	605.08
Section men	214,083	96,557,782	451.03
Other unskilled labor	90,572	50,611,021	558.79
Foremen of construction gangs and work trains	2,452	2,481,416	1,012.00
Other men in construction gangs and work trains	40,495	20,831,320	514.42
Traveling agents and solicitors	4,642	7,344,793	1,486.20
Employees in outside agencies	2,220	2,172,985	978.82
Other traffic employees	1,122	1,066,097	950.18
Train despatchers and directors	4,686	7,387,308	1,576.48
Telegraphers, telephoners, and block operators	18,361	14,043,005	797.54
Telegraphers and telephoners operating interlockers	7,425	6,097,661	821.23
Levermen	2,003	2,116,580	729.10
Telegrapher-clerks	9,065	7,203,781	794.68
Agent-telegraphers	18,597	15,234,672	819.20
Station-agents	14,108	13,025,045	910.33
Stationmasters and assistants	613	667,108	1,088.27
Station service	83,490	50,292,817	602.34
Yardmasters	3,122	4,898,949	1,569.17
Yardmasters' assistants	1,864	2,653,401	1,423.50
Yard engineers and motormen	12,192	18,565,187	1,522.74
Yard firemen and helpers	12,425	11,344,870	913.07
Yard conductors	11,716	15,864,387	1,354.08
Yard brakemen	30,523	35,527,444	1,163.96
Yard switch tenders	4,574	3,282,409	717.62
Other yard employees	4,650	2,880,125	618.58
Hostlers	6,916	6,646,768	961.07
Enginehouse watchmen and laborers	35,856	24,407,028	682.37
Road freight engineers and motormen	23,830	43,600,904	1,829.67
Road freight firemen and helpers	24,834	27,029,204	1,124.64
Road freight conductors	10,750	31,133,051	1,575.02
Road freight brakemen and flagmen	49,483	50,850,073	1,027.75
Road passenger engineers and motormen	11,817	24,023,430	2,100.12
Road passenger firemen and helpers	11,411	14,554,219	1,275.46
Road passenger conductors	9,036	18,068,180	1,818.46
Road passenger baggagemen	5,499	5,705,721	1,037.59
Road passenger brake and flagmen	13,560	13,814,894	1,018.80
Other road trainmen	3,742	3,143,571	840.08
Crossing flagmen and gatemen	14,541	6,918,744	475.81
Drawbridge operators	1,192	791,315	663.85
Floating-equipment employees	10,077	8,364,886	762.04
Express-service employees	16	8,553	534.56
Policemen and watchmen	7,470	5,285,171	707.52
All other transportation employees	9,044	6,271,211	630.65
All other employees	27,119	16,530,202	609.54
Total	1,400,342	1,164,844,430	826.52

II—AVERAGE HOURLY COMPENSATION OF TRAIN EMPLOYEES, 1915.

(cents)

Class of employee.	United States.	Eastern District.	Southern District.	Western District.
Road freight engineers and motormen	59.3	55.6	65.7	61.8
Road freight firemen and helpers	37.8	36.7	37.0	39.4
Road freight conductors	49.4	47.3	51.5	51.4
Road freight brakemen and flagmen	33.3	32.5	31.7	35.6
Road passenger engineers and motormen	80.5	74.2	94.2	84.2
Road passenger firemen and helpers	49.7	46.4	50.7	54.3
Road passenger conductors	65.3	62.6	67.0	68.6
Road passenger baggagemen	36.0	37.7	39.7	27.0
Road passenger brakemen and flagmen	37.6	38.7	32.8	37.8
Other road trainmen	29.0	25.0	28.9	30.9
Yard engineers and motormen	42.4	42.2	43.3	42.4
Yard firemen and helpers	26.0	26.7	24.0	26.0
Yard conductors	38.6	38.6	37.0	39.5
Yard brakemen	34.9	35.4	31.0	36.0

RIGHT ON THE RIGHT-OF-WAY.

BY MARK HARMON.

Out of the Switch-Yard Came Young Lochinvar, Close Pressed by Father Upon the Hand-Car.

HE deep well-pump sighed and yawned and stretched. Outside the walls of its home Kelly, on the old front-end timber, sighed and yawned and stretched. The roundhouse circle did not yawn. It napped in peace, for it was Sunday afternoon. Overhead, in the old cottonwood, a pair of sparrows were courting.

"I don't think much of this love-making," Kelly told them sternly. "It's all well enough for our would-be railroaders to marry and settle down so the call-boy can find them, but when the hostler leaves me in the lurch, like this very afternoon, it makes me sore.

"He said he had to get a facial massage because he was going to see his girl to-night. And when he gets back he'll be so afraid of spoiling the massage before quitting-time that he'll hide out and let me mess around with the dirty work, if I will, which I won't.

"No switch engineer can bluff me into doing anything on a Sunday evening. I've washed my rubber collar, and that settles it.

"I wish you'd look at those sparrows. He's telling her about his coal-record, and how she won't ever have to wash his overalls, and how he can get passes to Niagara Falls, and how he always calls the old man by his first name. You can see it in his eye."

The noisiest of switch-engines swaggered into view along the sandhouse track and stopped. The foreman swung from the footboard and lounged across the open space. He was a young man, tall and broad and blond, who smiled down at Kelly affectionately.

"Borrow me a switch-chain, Kelly," he said lazily. "Got a car down here with the coupler gone."

"What d'ye mean, Lock, grinning at me like we were on friendly terms?" demanded Kelly violently. "If the riffraff and panhandlers they hire for switchmen these days aren't a disgrace! However, we must try to rise above them.

"There's a couple of chains around the corner of the shanty here. Take one. See that you return it, too, or there'll be big chunks of raw switchman all over the place."

"Here's a cigar, Kelly, my dear," interpolated the tall foreman easily. "A good cigar. Tuck it between your rosy lips, and don't let's hear any more such awful language. Say—it's too far to carry that heavy chain across lots. I'll just run up to the switch and come in close, eh? Then we can put it on the foot-board without any difficulty."

"You'll run that engine clear to the switch and back again, and pull out the work-cars, and kick 'em down somewhere to get in—and then offer me another of these cigars to lift the chain on to the foot-board! But there, what's the use? Only it's things like this that makes anarchists, Lock.

"Look at me, slaving early and late, hot and cold, wet and dry, scorched in the glare of the fire-boxes, scalded by

escaping steam, grimy and calloused—and all—while the five able-bodied huskies that make one switch-crew take a joyous ride over to some out-of-the-way elevator and spend a couple of hours in a shady nook swapping stories. Oh, well, get out of hearing, if you want to. I'll tell you the rest some other time."

Kelly lit the cigar and leaned back in solid, silent comfort. After a while—when the insolent, care-free switch-engine had racketed along the other track and gone again—he squinted the length of his cigar in the direction of the happy pair above.

"Lochinvar—that's what they tied to him. Name's Jim. But when this story I'm going to tell got around, some highbrow said he was like *Lochinvar*. They called him that some, but it was long and fancy, so they shortened it up to Lock, which was his last name.

"Seems the original *Lochinvar* butts in on a country wedding that was being wound up with a dance, and after sashaying around with the bride for the space of a two-step he makes a get-away with her snuggled up close on his horse, and was a mile away before the dukes and knights and past noble grands had torn themselves loose from the free lunch.

"This Lochinvar of ours would probably have to have the wrecking-car and all hands to help if it came his way to get on a horse, but when it comes to floating against the front end of an engine—well, I bet he could do it nice even in a cast-iron suit like those old-timers wore, and with a sword hanging to him. He's all switchman.

"I never can get the hang of this story-telling business. Mostly I start at the middle and wind up at both ends; but I reckon in this case I'd better talk about the scenery a while. Soc LaRue's house and Soc himself 'll be about all of that. They called Soc a section foreman, but he'd been with the road so long they gave him the trackage in the yard limits, with an able assistant to stand out in the sun with the gang.

"In the old days he lost his head and went crawling over one of these foolish wooden bridges that was ablaze to flag a passenger-train. He got scorched so he could pass for a fire sale. One side of his face is a bit warped yet, even after forty years. So the company gave him an assistant for fear he'd get overheated again and be cross about it this time.

"Soc — yeh, Socrates was all of it—didn't have any ambition above being a section foreman, and he'd already started his castle a building. They couldn't do much more than to make life easy for him. About all he did for thirty years was to pump a hand-car up through that yard every day—setting an example to his gang.

"He was so heavy—must have weighed two-fifty—that he could put his weight on a handle-bar and just naturally make a hand-car act like a Wild West bronco. Only he had to stand sort of sidewise so his stomach would be out of the way. And bull-headed and bull-necked—say!

"When he first got the job he was hard up; and in those days the company wasn't building section-houses as promiscuous as they did later. They set down a condemned box car along the tracks, and Soc and his wife thought it was fine. Painted it white, and had geraniums and vines.

"There was the biggest kind of an irrigation ditch made a sharp turn right there—closed 'em in at the back and one side, same as a river. The railroad tracks were in front.

"Well, sir, Soc got set, and when he wanted a bigger house he insisted on getting another box car. Now there's six of them dinky, condemned thirties, alongside, crosswise, tandem — all ways you can think of.

"Soc lived there with his daughter after his wife was gone. Everything good inside, finished smooth as silk—piano, plumbing — but six box cars, just the same. There was a whale of a grain elevator on the south side that kept off the sun, and the running water in the

ditch made it cool. Altogether, it wasn't such a bad idea.

"Mary LaRue was away to school for a while, but when she got back, as pretty as she was, and started to keep house for her father—why, it was worse'n any of those old castles. For Mary LaRue wasn't exactly his living image. Not exactly.

"When she was twenty she was just slim enough. And the kind of red hair that isn't like a prairie fire by a whole lot, but made you think of the sun and a maple-tree and an October day. And her eyes were black. There wasn't any October to the rest of her. She was spring-time with most of the rainy weather left out.

"There are eight switch-engines loafing around these yards, and inside of a month it was so the yardmaster couldn't get any work done in the upper end. Absolutely none

"And if he wanted something special —a car set at the coal-chute, or a track pulled maybe—why, all he'd have to do was to take a velocipede and run down to Mary's dooryard. There'd be at least three engines out in front biting each other and kicking at the flies while the foremen would be in getting a drink of water or offering Mary some nice fresh fruit that had fallen out of a passing refrigerator.

"Soc never hung around home much except in the evening; but, shucks! he had the luck to come in one day when our Lochinvar was showing Mary a picture of his sister in Vermont. He was real fond of his sister, I guess. And the old man was so taken by surprise at their heads being close that he acted like a natural-born volcano.

"Did a lot of damage. Made Mary promise that she'd never have a man in the house unless he was home—all that heavy stuff. You take a girl like that Mary LaRue—tempered true as steel—and you can always make the sparks fly.

"Same time, good girls are pretty tolerable obedient — to somebody or other. It's a habit they get into. And the sign went up—'No switchmen need apply.'

"Lochinvar, he comes up here a couple of weeks after to sit in this very spot and tell me about it.

"'Kelly,' he says to me, 'Kelly, I can't eat—I can't sleep. I'm done.'

"'What d'ye want us to order?' I says to him. 'Shall we decide on a nice floral pillow, or 'd you rather have one of those gates ajar? Or we could have a wreath or a harp,' I says.

"'Don't joke, Kelly,' he moans, hollow as a tomb. 'Kelly, she was going to marry me. We were so far along that I got me a license on the chance of her being willing to some time; and I wanted to be ready.'

"'Sure,' I says. 'Nothing like being a good provider. You tell old Soc. Maybe he'll give you your money back.'

"'Quit it!' says our Lochinvar. 'Anyway, I did have an idea come to me, Kelly, and I thought you might help me out on it. I'm working nights now, and I can't get off, for they're short two crews. But I can steal a little time, all right.'

"'No doubt,' I remarks. 'What were you going to do with the time after you stole it?'

"'She told me that she'd dearly love to be serenaded by moonlight. She never was serenaded, Kelly. It might win her.

"'And there's that little mission church up at the end of the yard, Kelly. They do rescue-work, and the preacher sticks around his study every night till midnight. He's a nice chap. He tried to rescue me. I dunno just what he was getting at, but we talked quite a while.

"'He'd come in mighty handy. If I could put a serenade over and she gave way, we could hop my engine and be up to the mission in five minutes.'

"'What 'll Soc be doing?' I reminds him.

"'He goes to bed about eight. Anyway, he sleeps in the front wing. Mary's room is backed up against the irrigation ditch. He'd never hear me.'

"'That ditch is twenty feet wide,' I argues with him. 'You'd have to get the bridge gang out. No fun serenading over the sea that way.'

"'I could arrange it,' he says, hardly listening. It's like I say—this love-making isn't practical.

"'Only, Kelly, I can't play on anything,' he whimpers.

"'Can you sing?' I asks. I knew well enough, but I asks him to see what he'd say.

"'Oh, I guess I could sing some simple thing,' he says. 'But a fellow 'd have to play on something. It wouldn't be a serenade unless you played. I can't take no chance of her not liking it, old man.'

"I'm no judge of music, but I could see the proposition, all right.

"'You've seen these xylophones,' I tells him. 'Jiggers that you beat with a couple of little hammers — one for each hand. You can play on one. Anybody that can keep time can play on a thing like that.

"'Go up-town and get one of 'em, and practise this afternoon. For the rest of it, while I'm no professional song-writer, I bet I can get one of 'em to fix up something along your line.

"'There was a fellow here one day that was getting up a feature story—that's what he said. He was telling me what an opportunity there was for what he called adventure-expression in railroading, and gave me his card. It's in my desk,' I says. 'He'll write something to fit that xylophone, if anybody can; and I'll tell him it has to be a one-two-three time, so you won't get mixed up with your little croquet mallets.

"'I'll see him at noon, and bring your song around to you this afternoon, so's you can learn it by heart. If you can't eat nor sleep,' I says, 'you might as well be busy at that. Give me ten dollars to pay that feller. Those poets are mercenary. You don't know what mercenary means, do you, Lock?' I says. 'Well, it means ten dollars.'

"I went up to see the feller. He was resting himself by looking out the window. Lying down so flat in a soft chair that he looked like something squashed on the leather. I told him what we needed.

"'Ah!' says he. 'A serenade for a railroader girl! In her very blood is the pound of the wheels on the track! Does not her heart beat to the rhythmic swing of red lanterns? And the reckless adventurer the railroad lover. I have it!' he says. 'Sit here, my friend.'

"And he leaves me to meditate in the laziest son of a chair I was ever in, while he goes into another room to do his writing. He had it done in a jiffy, but I was on short time, so I had to rustle a messenger kid. I told him to tell Lock he was to fix up his best tune to those words —whatever he could sing best and work his xylophone with.

"And then I come back and got busy with the 381, that was leaking like a sieve, and never gave him another thought, except to be bitter thinking of that feller writing poetry in a leather chair while that 381 was leaking dirty water on my rubber collar. But after supper I remembered Lock was coming for me; and sure enough, while I was talking to the night foreman, having strolled in about nine, here comes pretty near nothing.

"'Come on, Kelly,' he begs me. 'My engine's out under the viaduct.'

"We went rattlety bang, lickety-split through the yard; but when we got to the other end Lock took to a siding, and we went slipping along easy. I reckon Lock had been making friends with the engine-crew that night. He needed friends.

"Pretty soon we stopped, and he took something off the front end that looked a good deal like a side of bacon in a leather case.

"'This is it,' he whispers. 'Come on!'

"You know, they always gurgle a lot about the moon in this kind of a story; but, shucks! All there was to it—the moon was about on a level with the top

of the elevator. And you wished it 'd stay up forever, and that the fellow that found out what steam 'd do had been making love under that same moon, instead of sitting in the kitchen watching the old teakettle. Yeh, it was a great night for Lochinvar.

"Made me feel lonely—like there was a mistake, and not enough girls to go around. I even felt sorry for old, snuff-dipping John Meiser, back there on the right side of the cab. And for the cub on the left side. And the two switchmen. I wished they could all have girls. I felt real tender about it. Oh, it was a great moon!

"Then we were standing on the brink of our little stream, with our lady's window straight across from us, and Lochinvar kicking around in some old timber.

"'Dog-gone it, Kelly, there was a long plank here, and it's gone,' he bleats. 'Some one's taken it. What 'll I do?'

"There it was. Those lovemakers aren't practical, anyhow.

"'Make you a raft,' I says. 'Here, help me with these grain-doors. Overlap 'em this way. See—how's that?' I says finally when we'd used about a hundred. 'Now I'll push you over with this scantling,' I says, 'and maybe you can do the rest.'

"It was easy. They held him up fine. In a minute he was close to the window which was a bit above his head—hardly any, though. He had a strap to his xylophone that went around his neck so's he could use both hands.

"He cleared his throat like he was a big frog and began. Me, I sat in the shadow and enjoyed it. It was a real funny tune that he'd made up—tinkle-tinkle-tumpy-tum—but it went just fine with the moon and the water and the little white box car palace where his princess was.

"I knew he was doing it with his whole heart, so I liked it. Liked it grand. I was glad she was getting him. He was in earnest enough that night to last a whole married life.

"And that was the way the tune went—tinkle-tinkle-tumpy-tum—and I know the words. I bet I've heard 'em a thousand times. Every time I go over there to play with their three-year-old they sing it to me plenty:

"Switchlights shining everywhere—
Starlight in the skies,
Danger here—danger there—
Heaven in your eyes,

"Grip on iron so sure and true—
This I understand,
All my hold on love is you—
Heaven in your hand

"Rainy night—slippery rail—
In a path apart;
Sweetheart warmth that cannot fail—
Heaven in your heart."

"And when he was all done, d'ye know that Mary LaRue flung her two arms out of the window and hugged him. It had been so quiet that I thought maybe she wasn't home. But she was.

"'You old dear!' she says. 'You old dear! Who's over there?'

"'Only Kelly.'

"That was what he said—'Only Kelly!'

"'I'm going to climb out the window, and we'll drift over to visit Kelly,' says Mary LaRue. 'Father's smoking out in front.'

"She did, too. She was out the window and on the raft in a second. A girl worth while, that Mary LaRue. And she looked it in the moonlight. More than that, a lot of folks can pass in the moonlight, but you never were worried about Mary standing the test of the sun. I didn't blame Lock for keeping his arm around her all the way across that dark, rolling tide. But I did blame old Soc for coming around the house so sudden and bellowing loud like he wanted to frighten 'em. Anybody that could make a noise like that on a night like that—

"'You Mary—' he begins.

"'Mary!' says Lochinvar.

"They were tight against the bank now, and I couldn't help but hear.

"'Mary!' he says. 'Will you marry

me, honey girl? I've the license,' he goes on, 'and the engine's only a step—and there's the mission church at the far end of the yard. Mary LaRue, I've been lonesome for you.'

"'I'll go,' she says, quiet an' earnest. 'Boy, I'll go.'

"'You'll have to hurry,' I says. 'Your father's getting aboard his hand car. He's got your number, Lock. He knows you'd head for your engine, instead of a taxi. Run for it! He's so lumbering it 'll take him a spell to get on the track.'

"Which was true enough. We had time to pass the word to John Meiser, and then Lochinvar and Mary and the two switchmen took the far foot-board, and I hopped the front and watched Soc come after us.

It was surprising how fast he made the hand-car move.

"The poor thing was panting when we let him catch up so he bumped us easy just before we got the Mission. Then old John reversed, and we began to push the hand-car back through the yard. Soc was so surprised that he stuck on, and presently we got to going so fast he couldn't get off.

He was speechless. Me, I always like to pass the time o' day.

"'Hello, old-timer,' I says.

"'You Kelly!' he sputters finally. 'I know you. You can't fool me! I know you!'

"'Sure!' I soothed. 'Everybody knows me. How's everything your way? Did you know there's a wedding on at the Mission to-night? We just dropped the party there.

"'By rights, this engine ought to be tied with white ribbon.'

"We was back at his place by now, and John Meiser stopped. The old man climbed off the hand-car and started into the house with never a word. But shucks! I felt so mellow in that moonlight I just couldn't seem to let him go in alone that way.

"'Soc,' I says, 'we've known each other long years. I wouldn't let Mary LaRue marry any outlaw,' I says. 'Lock's clean and straight and sober — and you know the time he saved the Fairly boy without thinking special of himself. He doesn't run hot nor die out seven miles from nowhere. He goes the whole way. Now,' I says, 'you go in and put on a coat, and we'll run back and take your daughter and her husband over to Tom Garrity's and blow them to a wedding supper.'

"Say! I never will forget that supper! And the moon coming home after! It was sure a fine moon. The finest moon I ever saw!"

WIRELESS.

BY CHARLES H. MEIERS.

WHEN wild waves lash the tortured, weakening ship
In ruthless fury, far beyond the land,
Reducing it to helplessness, the whip
Enslaving it beyond its power to stand,
Lo! Far and fast goes forth a thrilling cry
Entreating sister ships to render aid.
So saves the wireless those who needs must die,
Should it not flash, and rescue be delayed!

R. R. RUNS SCHOOL ON WHEELS.

A ROLLING SCHOOL IS OPERATED ON THE RAILS OF THE SOUTHERN PACIFIC SYSTEM WHERE CONSTRUCTION WORK IS UNDER WAY IN THE WEST THE SCHOOL CAR, CARRYING THE WORKMEN'S CHILDREN, MOVES FROM PLACE TO PLACE WITH THE CONSTRUCTION GANG

NO CHILD HAS EVER MISSED A DAY IN ATTENDANCE AT THIS UNIQUE INSTITUTION NO WONDER! IF ONE OF THEM SHOULD PLAY HOOKEY FOR THE DAY HE MIGHT RETURN TO FIND HIS CLASSROOM A HUNDRED MILES OR SO AWAY

PITY THE POOR YARDMASTER!

Job To-Day Is Humdrum Compared with That of Yore—Nothing to Do Now But Keep Cars Moving and Grin When Bawled Out.

USED TO BE ROAD'S OFFICIAL PIRATE.

Sing Ho, For the Gallant Days When the Rakish Switch-Engine, with Bell Muffled and Binnacle Covered, Made Prize of Unsuspecting Gondolas and Heavy-Lidded Sleepers!—Links and Pins Were Real Treasure-Trove.

BY CHARLES FREDERICK CARTER,
Author of "When Railroads Were New."

VERY train and switch-engine on the Texas and Pacific Railroad came to a full stop wherever it happened to be at two o'clock on December 27, 1913. The machines in the shops, the mechanics at their benches, the sectionmen out on the line, the telegraph-operators at their keys, the clerks at their desks, all stopped work at the same instant. For five minutes the whole system stood silent and motionless as a last tribute of respect to

The president of the road?

Highest Honors for P. W. Hilgers.

No; to P. W. Hilgers, yardmaster at El Paso, who had come to an untimely end on the preceding Christmas Day.

It was the irony of fate that a man who had spent his life working among swiftly moving cars and ponderous locomotives should be knocked down and killed by a wretched little motorcycle.

Hilgers had been herding box cars on the Texas and Pacific for a quarter of a century. Everybody liked him, from the men who worked under him to the small boys he had to chase out of the yards from time to time to keep them from being run over.

The officials, especially, esteemed him so highly that they paid to his memory a tribute usually reserved for those occupying far more exalted positions.

It isn't very often that railroad officials get up a dinner on their own account; but sundry officials of the New York Central Railroad gave a very fine one on December 16, 1911. The whole push of brass collars was there, including Vice-President—now president—A. H. Smith. The dinner was given to commemorate the fortieth anniversary of the day on which John J. Loftus linked his fortunes with those of the New York Central.

Everybody made speeches at Loftus, telling him how lucky the Central had

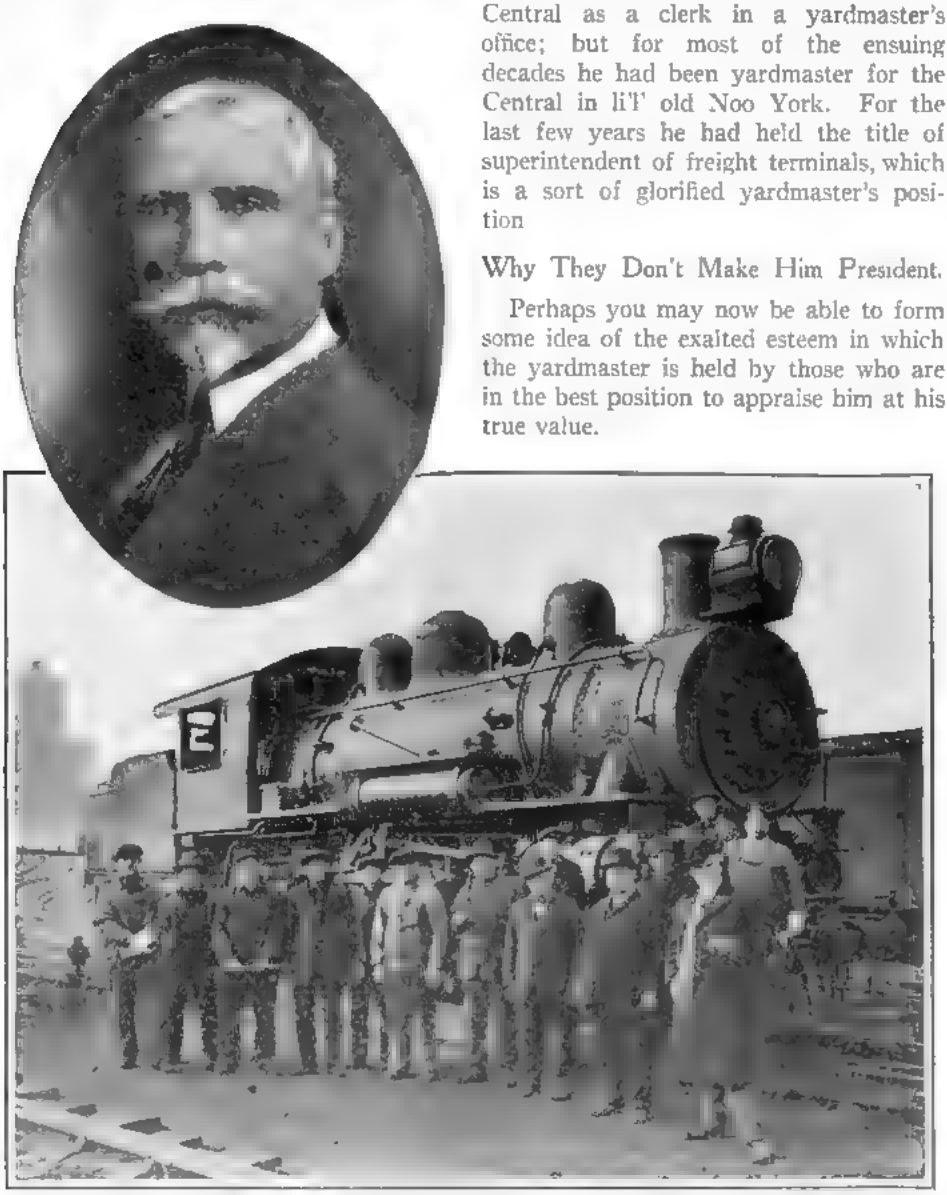
been in having his services for so many years, and all those nice little things that almost convince a fellow that, after all, this is the very best world he ever lived in.

Chairman of the board of directors, perhaps?

Oh, dear no! Forty years before the date of the dinner John J. Loftus earned his first day's salary on the New York Central as a clerk in a yardmaster's office; but for most of the ensuing decades he had been yardmaster for the Central in li'l' old Noo York. For the last few years he had held the title of superintendent of freight terminals, which is a sort of glorified yardmaster's position

Why They Don't Make Him President.

Perhaps you may now be able to form some idea of the exalted esteem in which the yardmaster is held by those who are in the best position to appraise him at his true value.



JOHN J LOFTUS, SUPERINTENDENT OF THE NEW YORK CENTRAL S YARDS AT NEW YORK, WHICH ARE AMONG THE LARGEST FREIGHT TERMINALS IN THE WORLD, RECENTLY CELEBRATED HIS FORTIETH YEAR IN THE CENTRAL'S SERVICE THE LOWER PHOTO SHOWS MR LOFTUS WITH HIS ASSISTANTS

Section-hands, brakemen, telegraph-operators, freight-rustlers, all have worked their way to the top of the railroad heap; but I never heard of but

one yardmaster who was allowed to become president of a railroad. Fact is, the type of genius capable of being evolved into a successful yardmaster is so rare that the material simply cannot be wasted to make a mere president. When a railroad gets hold of a good yardmaster it chains him fast to his job and keeps him there forever and ever.

There is Harry Van Santford, for instance, general yardmaster of the New York Central in New York City. Been on the job for a quarter of a century. And there is Joe Mandeville, general yardmaster of the West Shore at Weehawken; same sentence, fourteen years of it with his present title and not a minute off for good behavior.

Mandeville's boss is T. C. Murphy, who bears the title of terminal trainmaster. When you get down to the facts, a terminal trainmaster is simply a yardmaster raised to the *n*th power.

Murphy links the modern yardmastership to that of a bygone era, for he began railroading in the year one. Following the well nigh universal custom of former days, Murphy, in his time, railroaded from New York to Oregon and from Minnesota to Texas.

The things that Murphy doesn't know about the inward psychology and outward cussedness of switchmen and yardmasters, their heirs and assigns, would make a very small book.

The Ups and Downs of the Long Ago.

Ah! But it would warm the cockles in the heart of a veteran to hear Murphy talk of the Long Ago. In those delightfully irresponsible days the yardmaster of to-day was the switchman of to-morrow, and *vice versa*.

Of all classes of railroad men, those who followed the yards were perhaps the most persistently peripatetic. They changed about the country with the wind—in Texas to-day, in Colorado next week, in Chicago the week after that, and in Frisco the following month.

When they blew into a town they hunted up the yardmaster, of whom they inquired, "How 're ye fixed for switchmen?" or "Hirin' any brakemen to-day?"

If the answer was "Yes," as it usually was, they proceeded forthwith to "herd box cars," or went to "ketchin' cars," after first taking the precaution to request some of the home talent to "hold 'em up at the boardin'-house."

Boomer Was in His Glory.

These itinerant switchmen always affected to look down upon the home talent which worked steadily, year in and year out, in the same yard, as inferior beings who knew naught of the real science of railroading. To be sure, these provincial amateurs were good enough to borrow money or clothes of till the first pay-day.

Then, to avoid the annoyance of meeting expectant creditors, they would hunt up the conductor of the first train leaving town, whom they saluted thus:

"J'ever extend any favors to railroad men?"

Then they would make themselves at home in a day-coach or the caboose, as the case might be—it was perfectly immaterial which it was to these passengers—and ride until they were hungry. Then they went ashore and boned the first yardmen they met for a bite.

Murphy tells of a yardmaster in Pendleton, Oregon, who was wont to invest his entire salary in meal-tickets, which he loaned to these wanderers. They were supposed to eat once and return the ticket to the owner to be passed along to the next man; or perhaps the owner might get an occasional mouthful himself.

But all that is changed now. You cannot get a job in the yards or elsewhere now without making a written application, which reveals the character of your education or the lack thereof, and giving five references, which are invariably investigated. And if you are more than thirty years old your name is Mud.

A BLOCKADED YARD MEANS A BLOCKADED ROAD, AND JUST NOW EVERY YARD IN THE COUNTRY IS IN THAT CONDITION DUE TO THE CONGESTION OF FREIGHT. THE PHOTOGRAPH ABOVE SHOWS THE WEST SHORE YARD AT WEEHAWKEN IN THESE TROUBLOUS TIMES

Photo by Brown Brothers

When these hand picked switchmen do get a job they settle down for life. Steadiness of employment makes for discipline, which relieves the modern yardmaster of a burden that his predecessors sometimes found difficult to manage.

Beyond any doubt, the yardmaster needs any little relief like that, for his

THE RAILROADS SPEND $170,000,000 A YEAR JUST TO KEEP YARDMASTERS BUSY. THE PENNSYLVANIA YARDS AT JERSEY CITY (SHOWN ON THIS AND THE OPPOSITE PAGES) FURNISH PART OF THE PROOF

ANOTHER PHOTOGRAPH WHICH WILL GIVE SOME IDEA OF WHAT THE YARDMASTER IS UP AGAINST WHEN TERMINALS SUCH AS THOSE AT THE PORT OF NEW YORK BECOME CLOGGED UP WITH EXPORT FREIGHT THAT CAN'T BE EXPORTED

Photo by Brown Brothers

responsibilities are great, as I shall endeavor to make clear. In the first place, there are as many varieties of yardmasters as there are of apples

A given specimen may be a switchman yardmaster in charge of a single switch-engine and its crew at some lonely division terminal on a third rate prairie

AND IN ORDER TO KEEP LIFE FROM GROWING MONOTONOUS TO THE BOYS, THEY GIVE THEM COMMAND OF 11,000 SWITCH ENGINES WHICH TRAVEL SOME 340,000,000 MILES A YEAR TO KEEP TRAFFIC MOVING

road; or he may occupy any grade in an ascending scale of importance up to the general yardmaster in supreme command of the great terminals at New York, Chicago, Boston, Philadelphia, and so on. These latter officials are czars, kaisers, autocrats, dictators of a railroad system within a railroad system.

In his own dominion the yardmaster's word is supreme law, from which there is no appeal. And these autocrats sometimes reign over pretty sizable kingdoms.

The Milwaukee terminals of the Chicago, Milwaukee and St. Paul, for instance, comprise more than three hundred miles of storage, industrial, and classification tracks divided into seventeen yards, each having a capacity of three hundred to twenty-seven hundred cars. The force of eighty-three crews that works this great terminal system is under the supreme command of a superintendent of terminals.

Milwaukee Terminal's Hierarchy.

The passenger-yard work, which includes the receipt and disposal of a hundred trains a day and the despatching of an equal number, is under the direction of a passenger yardmaster, though his title in this instance is stationmaster

The freight-yard work is under the direction of a day general yardmaster and a night general yardmaster, each of whom has an assistant yardmaster and twenty plain yardmasters and thirty-three clerks. The night force must make up and despatch about a hundred trains before midnight, and spot all the cars for the immense industries of Milwaukee before seven o'clock in the morning.

Even at Galesburg, Illinois, which is not nearly so large a place as some places that are a great deal larger than Galesburg, the Chicago, Burlington and Quincy alone has for its four divisions centering there four yards having an aggregate capacity of 8,979 cars. There are 76 passenger and 130 freight train movements daily, or a train movement every seven minutes on the average. Thirty-two switch-engines and crews work here, and they have handled an average of 6,800 cars daily for ninety days at a stretch.

The yards of the Missouri, Kansas and Texas, at Parsons, Kansas, beat this record all to pieces; for while the yards are very much smaller, having a capacity of only 840 cars, an average of 1,800 cars is handled in and out every day. That is, the yard must be completely filled and emptied a little oftener than twice in every twenty-four hours.

And this with a train movement every fifteen minutes on the average!

To make matters still more interesting, an average of five thousand bad-order cars are handled over the rip-track every month.

Taking the United States as a whole, the yardmasters have command of 10,081 switch-engines which, in 1914—latest figures available are for that year—traveled 336,187,276 miles to keep the traffic moving during the twelvemonth. The work done under the direction of these yardmasters cost the railroads the rather tidy sum of $170,336,228.

He Has His Bosses, Though.

Important as the position of the yardmaster is, he reports to the trainmaster, the same as a conductor, and must, like the conductor, obey the orders of the train-despatcher. He has charge of the men in the yards and of the movements of trains and the distribution of cars in the yards.

A few of the things that keep him from being bored to death are to see that men and engines are ready at the times ordered; that trains are properly made up, and that they leave on time; that conductors are furnished with waybills for cars leaving; that the conductors deliver waybills for all cars arriving; that car doors are properly secured; that cars are inspected, and that those needing repairs are sent to the rip-tracks or the shops, as may be required; that cars

are not unnecessarily delayed in the yards; that records and reports are made according to instructions.

He must be familiar with the rules of the freight service and with the duties of employees connected with trains, and he must see that these men discharge their duties efficiently while under his jurisdiction. Finally, he is expected to report all violations of rules coming to his notice.

The yardmaster's work requires as careful planning as the movements of trains on the road. He has regular schedules for certain engines which must be carefully adhered to if the whole system is not to be thrown out of gear.

For instance, the West Shore was replacing a transfer bridge at Weehawken. The engineers figured that the work could be done in one day. But as it wasn't finished that day they asked Joe Mandeville to let 'em have a switch-engine for an hour or two.

T C MURPHY IS KNOWN OFFICIALLY AS "TERMINAL TRAINMASTER" OF THE WEST SHORE'S YARDS AT WEEHAWKEN BUT IF YOU GET TO MEET "T C." AND TALK TO HIM YOU FIND OUT THAT HE'S JUST PLAIN BOSS OF THAT WHOLE NEW JERSEY OUTFIT AND YOU FIND OUT ALSO THAT WHAT T C DOESN'T KNOW ABOUT RAILROADING ISN'T

THERE IS ONE MAN WHO CAN NEVER BECOME A RAILROAD PRESIDENT IT IS A YARDMASTER HE IS FAR TOO VALUABLE TO WASTE IN THAT WAY SO WHEN A ROAD GETS A GOOD YARDMASTER IT CHAINS HIM FAST TO HIS JOB AND KEEPS HIM THERE FOREVER JOE MANDEVILLE FOR INSTANCE, HAS BEEN GRACING THE WEST SHORE'S WEEHAWKEN YARDS FOR A QUARTER-CENTURY

Joe let 'em have it, but the engineers did not return it for six hours. The result was that as that engine's work was not done for the six hours the whole West Shore system was balled up for the day.

Telegrams Are Nothing in His Life.

The yardmaster plans his work from train-conductors' "consist" reports which are wired to the train-despatcher as soon as an approaching train leaves the last division terminal beyond. He keeps tab on the way things are going from reports made up of the number and position of loads and empties in the yard at least twice a day.

Each assistant yardmaster, when he goes off duty, leaves a report for his successor showing the cars on hand and the tracks that are filled or upon which work is being done, so that the man coming on duty can work without delay.

Complete telegraphic reports are sent twice daily to the superintendent's office, so he can keep in touch with what is being done. The car records that are carefully kept in the yardmaster's office are the foundation on which all car and train movements are based.

In these hustling days the yardmaster is glued to a telephone most of the time. That is to say, some yardmasters are. Of course, different men have various ways of doing their work. But in any event they telephone a great deal and then they telephone some more.

All up-to-date yards are thickly peppered with telephones, with extra call-bells stuck around at strategic points so that a man at work in the yard is never beyond the reach of the phone. Shippers have telephones, and they do strive conscientiously to get their money's worth out of them. The general offices have telephones also; indeed they do.

"Central" as Swiss Bell-Ringer.

Go down to the foot of West Seventy-Second Street, in New York, and loll over the wall that separates the municipal domain from the New York Central's right-of-way, and you will imagine that some Swiss bell-ringers are rehearsing in a dingy brick building across the tracks. But it is only the telephones with urgent messages for the yardmaster.

There are about forty telephones in that building, and they all ring as if they were two hours late and trying to make up time.

Some yardmasters spend their time out in the yards, giving signals, bawling out orders, and, at the proper intervals, exploding in philological fireworks. For no man who has not actually worked in a railroad yard can form any idea of the number and variety of things that can go wrong there.

Some of them go so far wrong that no one but a man who has devoted a lifetime to the cultivation of a vocabulary can do the situation justice.

Other yardmasters have regular office hours and devote certain parts of the day to personally conducted tours of the yards. Yet others go out only when necessary to straighten out a tangle.

In any event, the yardmaster is never out of a job. Especially in times of storms and other troubles he works all day and most of the night.

Yard operation differs from most other administrative work. Arrangement and execution are only the beginning. The vastly greater and more important duty consists of vigilance and alertness in estimating the nature and flow of traffic and in providing an open channel for it.

Every unusual incident hinders the yardmaster, but nothing ever helps him. A blockaded yard means a blockaded road, and that raises Cain with the revenues.

The storm of March 2, 1914, was the worst in a quarter of a century. The New York yards of one of the trunk lines were blocked because the yardmaster happened to be off duty; and one of his superior officers, seeing that the switch-engines could do nothing, ordered them all laid up.

That was a bad mistake; for if they had been kept running up and down the tracks the latter would have been kept open. Several hundred men had to be called in to shovel out the road after the storm had cleared away.

Another one of the trunk lines was blockaded by that storm so completely that the effects were felt for a month afterward.

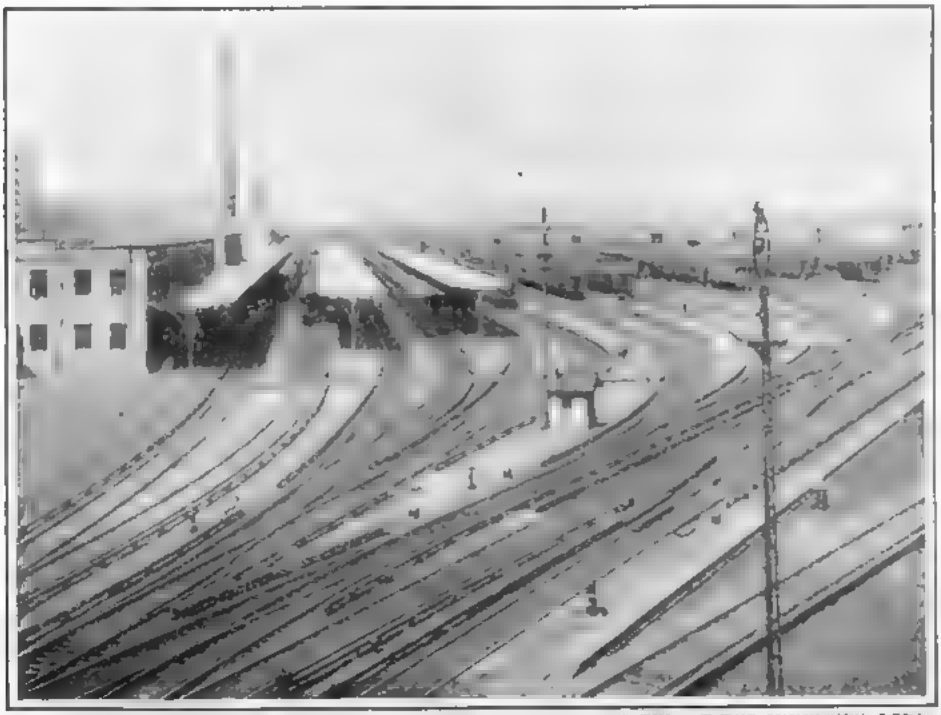
Once Was Road's Official Pirate.

In more primitive days yardmasters were the official pirates for their roads. That is, whenever the interests of the company required it, they were expected to commit grand larceny.

For instance, a former general manager of one of the trunk lines made his principal bid for fame on the ground that he saved the company ten thousand dollars a year by the simple expedient of vetoing requisitions for links and pins in

ON THE JERSEY SHORE, OPPOSITE MANHATTAN, YOU MAY COME UPON SCENES SUCH AS THIS ANY DAY OF THE YEAR AND IF YOU HAVE ANY NOTION OF WHO HAS TO TAKE CARE OF IT ALL, YOU WILL SAY WITH US, "PITY THE POOR YARDMASTER!"

Photo by Brown Brothers



A VARIETY OF SWITCHES AS NUMEROUS AND AS COMPLICATED AS THIS AT THE SUNNYSIDE, LONG ISLAND, YARDS OF THE PENNSYLVANIA IS ENOUGH TO GIVE ANY ORDINARY MAN A NIGHTMARE. YET YOUR YARDMASTER KNOWS EVERY ONE OF THEM THOROUGHLY

the good old days when couplings were made with such things.

When the night yardmen reported for duty across the Hudson River from a well-known metropolis during that general manager's régime they would find about six hundred couplings to make and not a blessed link nor pin in the yards, because the day men had swiped them all to make up trains.

"See a Pin and Pick It Up—"

So it was the nightly job of the yardmaster to take a switch-engine and a box car to the yard of a connecting line under the pretext of making a transfer. If any switchmen were inconveniently hanging around, he would invite them into the nearest place of entertainment, where he proceeded to make himself agreeable while his men collected links and pins as souvenirs of their visit.

Souvenir-hunting in those yards was mighty hard work, for the employees of that particular road were of such a mean disposition that they would set brakes on two or three cars at the end of a string, then take the slack and set some more brakes at the other end; so that pin-pilferers could not operate without climbing up and releasing brakes, then climbing down and sweating and grunting to push the cars back one at a time by main strength and awkwardness to slack the pin. Of course if they had coupled an engine on it would have given the snap away.

When the gleaners had collected all the coupling paraphernalia they needed they would signal their commander-in-chief, and then the engineer would hook her up and pull 'er tail to get out of reach before the guests of the evening found out what had been going on.

It is of record that at least two yardmasters stole sleeping-cars and got away with the goods. In 1870, when a new line was opened between Indianapolis and St. Louis, there were but two old Sanderson sleepers for service between the two towns.

One night the Original Line had no sleeper for its night train to St. Louis. The superintendent hoisted a signal, saying that the Original Line expected every yardmaster to do his duty.

Thereupon the yardmaster at Indianapolis, a hospitable soul, hustled down to the New Road's yards to invite the whole yard-crew around to the Dorcas Society to have a cup of tea. Meanwhile his men tied down the bell on their engine, hooked on to that sleeper, and ran for their lives.

They were discovered and held up, but clung to their prize. That night the Original Line's train sailed proudly out of Indianapolis harbor with a real sleeping-car tagging along behind.

Two nights later the New Road's yard-crew waited until the Original Line's train was made up and ready to leave, when they coupled on to that sleeper, made the passengers tumble out, and snaked the sleeper away in triumph. The second night thereafter the Original Line nailed that sleeper and guarded it with a switch-engine at each end, reenforced by the niftiest bruisers in the yard force, till the train pulled out. Things went on this way for two weeks before the sleeper issue was referred to The Hague Tribunal for settlement.

Got His Start "Borrowing" Box Cars.

Then there was the present general passenger-agent of a Texas railroad that you know just as well as I, who got his start in life borrowing box cars when the owners weren't looking. The present general passenger-agent was then working for a road so poor it could not afford cars to move its traffic.

So this gentleman, in his capacity of general freight-agent, hustled for cotton shipments in daylight; then at night, in his dual rôle of general yardmaster, he would take a switch-engine, with bell tied down and headlight covered, and run down to the yards of a rich connection, where he would help himself to nice, clean box cars in which to haul cotton.

Talent like that is sure of recognition. Soon this enterprising young man attracted the attention of a road that had cars to burn, and the box-car borrower has been climbing ever since.

That could hardly have been the only instance of the kind on record, for there are to-day many cars that have been away from their home roads for five years, *per diem* rules to the contrary notwithstanding. And there are eight hundred cars down in the Republic of Mexico that the owners would like very much to see again

These estrays were a source of revenue to the various revolutionary factions for a long time. Whenever a major-general found himself short of change he would order his army to round up some of those gringo box cars and drive them up to the border, where they would be delivered to the Americanos on payment of two dollars each—two dollars United States currency; Mexican money not accepted.

Lord High Explainer, Too.

Besides being the official pirate, the yardmaster was, and still is, the Lord High Explainer. Whenever anything goes wrong -and you'd be surprised to know how many things can go wrong in the best-managed yard—several hundred general officers, their assistants, chief clerks, and office-boys, each and severally, jump on the poor yardmaster and demand an explanation.

If a car of export freight happens to get shut out from a steamer, two or more explanations will be required all around That is why the yardmaster has such a large staff of stenographers and clerks.

Officials do not monopolize the explanations. The shippers get their share of them.

Some men are born kickers, and some

HOW WOULD YOU LIKE THE JOB OF CUTTING OUT ONE OF THOSE CARS IN THE FOREGROUND AND SPOTTING IT OVER ON THE ELEVATOR TRACKS? THAT'S THE SORT OF THING A YARDMASTER HAS TO TACKLE A DOZEN TIMES A DAY

Photo by Brown Brothers

cultivate their talents. In Weehawken there dwells an undertaker who has developed a proficiency in kicking that is slowly bringing the gray hairs of Joe Mandeville in sorrow to the grave.

You see, the West Shore is fearfully cramped for room down there between the river and the bluffs. Under the circumstances certain tracks are used for milk at night and for local team freight in the daytime.

The yardmaster has to spot cars on the team-track in the morning and pull them at night to clear the way for the milk-trains. Next morning he has to set cars back that have not finished loading or unloading.

Cussedness of the Coffin Consignee.

Well, this undertaker begins telephoning Joe about a month before he makes up his mind to order a car of coffins, and he keeps it up steadily thereafter till the car arrives and has been duly spotted on the team-track

Then Mr. Undertaker loses all interest. He then wants to leave the coffins in the car and the car on the team-track until his prospective customers have need of them.

Joe sees that the agent collects all the demurrage the law allows, and they spell each other nagging Mr. Undertaker to come and get his darned old coffins; but they never feeze him.

So Joe spots the car in the morning and pulls it at night until he wears the journals out, and then he has to explain to the master car-builder and the president and all the rest of 'em down to the section-boss, who is sore because Joe is wearing out the team-track by continually hauling that car of coffins back and forth over it.

STILL A PROFESSIONAL.

BY J. B. MIDDLETON.

THE patriotic plumber saw
The shimmering flag against the sky,
So he became a Johnny Raw,
A private soldier, stepping high.

He loved the banner of the free,
(Pray let us pause a while to cheer
The bold recruit who used to be
A sanitary engineer!)

Before they charged the other side,
And every man was feeling queer,
The ardent plumber was descried
Departing slowly toward the rear!

The colonel looked with lowering eye.
"Explain," he cried, "nor dare to trifle!"
"I go," the plumber made reply,
"To get my bayonet and rifle."

OLD TIMES ON THE COMSTOCK.

In the Seventies 25,000 People Lived on the Famous Silver Ledge and Things Were as Lively at 3 A. M. as at 3 P. M.

AH, THOSE WERE THE SPORTING DAYS!

Who Could Forget the Immortal Combat between Dublin Pete and John Askew?—Big Cornishman Lasted Three Rounds after Both Eyes Were Closed—Grand Jury Could Find No Evidence Though Every Member Was There, and the Judge, Too.

BY SAM P. DAVIS.

ALONG in the seventies the great Comstock Ledge saw its best, when twenty-five thousand people lived in Virginia City, Nevada, and Gold Hill and the Bonanza mines paid millions in dividends monthly.

From the North End on C Street, down over the Divide into Gold Hill at the South End, there was no particular subdivision between night and day on the Comstock. As a local poet has observed—

> The days were spent in reveling,
> And the night were spent in deviling.

Gamblers Worked in 8-Hour Shifts.

At three in the morning the crowds of merrymakers and pleasure-seekers on C Street in Virginia City were as numerous as at three in the afternoon, and if you were in a hurry you had to take the street instead of the crowded sidewalk.

All kinds of sport flourished on the great ledge in those memorable days. Gambling was one continuous performance day and night, and thousands were frequently staked on a single card. Faro was the favorite game and the houses were open day and night, running on eight-hour shifts like the mines.

Horse-racing, prize-fighting, wrestling and kindred sports were always in order. Sometimes the annual wrestling-matches on the Ophir Dump lasted a week. They generally started with fifty men paired off with each other on a side. The defeated contestants retired as fast as they went down, until two brawny wrestlers were left for the final struggle, which would tell whether an Irishman or a Cornishman was the "best man on the Comstock."

The racial rivalry between the Cornish and Irish was taken advantage of by the mine-owners. When a shift of Cornish miners had a drift to run and the Irish miners another in the same mine neither shift would allow the other to beat them, if hard work could help it.

This fierce rivalry between the two

factions was carried on in business, politics, and sports.

It seemed to have reached its dramatic culmination about thirty-seven years ago in the great pugilistic battle between "Dublin Pete" and John Askew. Askew was a man of giant build and tough fiber, with nothing but hard muscle covering his raw frame. He had toiled daily in the drifts for years and had gained the reputation of being able to work longer and harder than any man on the ledge.

He finally acquired the habit of signing his name "John Askew, Best Man on the Comstock." Whenever he saw an Irishman's name on a hotel register he would walk up with a flourish and sign his name in bold letters just under it.

This continued assumption of supremacy was galling to the Irish element, but they had to stand it for several years until they found a man who seemed fitted to take the Cornishman's measure in the ring.

Dublin Pete of New York was matched to meet Askew. Peter was selected some months before and put to work in the mines regularly, his past performances as a pugilist being kept in the background.

Curiously enough Dublin Pete never saw his doughty antagonist until they met in the ring. The match was made about six weeks before the principals went into active training.

Chief Justice Was Fight Fan.

At that time I was a reporter on the *Virginia Chronicle*. A few days prior to the bout I was sent to Carson City to interview the chief justice of the State. He invited me to lunch and, as the coming mill was an event that excited interest all over the coast, the probable outcome of the fight was discussed at the table.

The chief justice, a man with a lot of sporting blood in his veins, remarked that were it not for the fact that he occupied a judicial position he would dearly love to be present at the fight, as he enjoyed any contest of skill and endurance between either men or horses. His wife took him severely to task for expressing such plebeian sentiments.

As I was preparing to leave the house after lunch the lady of the house beckoned me aside and, as she thrust a package into my hand, said in a stage whisper:

Bottled a Wallop for the Irishman.

"Give that to Dublin Pete and tell him that it comes from a friend of his race. If he drinks it in the ring he can't lose the battle. It's a punch of my own invention. Don't mention my name or tell my husband."

With this she left me. After I had concealed the packet in my overcoat pocket the chief justice showed me out, and as he did so he said:

"If Pete wins would you mind sending me a wire?"

Going up on the train that afternoon I recalled that the judge, who had just been elected, had been most viciously fought by the Cornish element in the campaign because during a previous term as judge he had given a new trial to an Irishman who had killed a Cornishman in a fracas on the Comstock.

That evening I strolled into Askew's training-quarters and saw him in action for the first time. I noted that he had but one style of delivery, which was very slow, and that his defense was poor. His favorite blow was a right swing which was easier to avoid than to guard against. His strength was abnormal; but like most heavily muscled men he was not active.

I was somewhat surprised at the showing the Cornishman made, as I had been under the impression that he was a marvel of quickness and skill. I also knew that Askew's antagonist labored under that impression and that he had been more or less disheartened by it.

I decided to call on Dublin Pete and post him on Askew's weak points. When I found the Irishman, in his room over the Sawdust Corner, he already seemed a beaten man. For some reason he was laboring under the impression that he had been overmatched. He also had the idea

that the referee was already "fixed" to give him the worst of it.

When I told him how slow his opponent was and informed him of Askew's style of attack and defense the news seemed to put new life and courage into him. Then I gave him the bottle of punch, which at first he suspected was doped; but when I finally told him that the wife of a high official and the leading society woman of the State had sent it as a special contribution to the Irish side of the battle he assured me that he would take it into the ring and use it as a last relief in case of emergency.

At noon next day Virginia City was almost deserted. A vast crowd went out beyond Cedar Hill, where the ring had been pitched just over the county line, in Washoe County, so that the sheriff of Storey could not interfere.

The joke of the thing was that Robert Lindsay, former attorney for fight promoters, was then serving his first term as district attorney of Storey. The year before, Lindsay had been called upon by the sports to give some legal advice regarding a prospective mill; and, it being illegal to fight for money, he had advised that they pitch the ring just over the county line at a point where the Washoe sheriff would have to travel nearly thirty miles in order to stop the fun.

"Advertise your fight in Storey County and at the last moment pull it off in Washoe," he told them.

Foxed the Sheriff of Storey.

Lindsay had even shown them the county boundary line and marked the place to drive the stakes.

The managers chuckled as they again followed the advice of their former counselor. To make assurance doubly sure they had driven the stakes in the same identical holes they had occupied the year before.

It was about one o'clock in the afternoon when the men faced each other for the most dramatic and long-drawn ring battle ever fought in the West. The Irish element were massed behind Pete's corner, and the Cornish were in solid phalanx behind Askew's.

One could almost feel and handle the excitement.

"One thousand even on John Askew!" came across the ropes from the Cornish side.

"Taken!" came back like a flash; and a cheer went up that shook the hills.

It was "Champagne Liz" who had taken the bet.

She was a queer character of the Comstock, belonging to just such a wild camp as Virginia City was in those days.

Liz Bet the Cornish Off the Map.

For several minutes, amid the cheers of the Irish, Champagne Liz hurled her challenges across the ring and waved a wad of currency in the air. She had made a "killing" at faro in the Sawdust Corner the night before and now put her winnings in behind Dublin Pete until she had five thousand even money on the Irishman and had bet the Cornish to a standstill.

There was a lull in the wagering for a few moments while the Irish taunted the Cornish on their lack of nerve. Then the little blond woman with the bibulous appellation shouted out, and her voice rang strong and clear:

"Ten to seven on Dublin Pete. Take it, you cowards!"

Some one took a hundred dollars on those terms.

"Ten to seven! Any part of a thousand! Put up or shut up!" she continued, standing on tiptoe and brandishing her handful of currency.

Then the bets flew back and forth across the ring until there was hardly a man in the great crowd that did not have something up.

When there was another lull in the betting the referee took his place and announced that the fight would be for a stake of one thousand a side, bare knuckles, London rules.

The men shook hands at the call, and

a moment later the battle opened. Askew swung his right at Pete's head. The latter drew back a few inches and after the blow had passed he landed a heavy right-hand blow on his opponent's jaw. Then he realized that the tip given him on Askew's style of fighting was correct.

Round after round the same thing occurred, until the Cornish element began to realize that their idol was getting the worst of it. Each blow planted by Dublin Pete brought out a roar of approval from his friends, while back of Askew were two or three acres of Cornishmen, grim and silent, watching their man gradually having his face pounded out of all semblance to humanity.

Suddenly there was a change in the tide of battle. One of Askew's right swings landed. With the scent of victory in the air Pete had become careless and had not thrown his head back in time.

Seconds Drew Colts to Hearten Fighter.

Askew's right fist swept Dublin Pete's mouth almost bare of teeth. In all the ring battles I ever witnessed I never saw so vicious or damaging a blow.

The Irishman staggered back into his corner, fell on his face and attempted to crawl through the ropes on his hands and knees.

It seemed the end of the battle. A yell of exultation came from the Cornish corner and only a painful silence from the Irish behind Pete.

"Get back and fight, you hound!" cried Champagne Liz. An instant later Paddock and Hughes, Pete's backers and trainers, pushed him back, covered him with six-shooters, cursed him in all the blistering vernacular of the Comstock, and threatened his life if he did not face the scratch.

The scene at that moment was the most dramatic ever witnessed at a ringside. The ropes had been broken down and a dozen men were in the ring with drawn pistols keeping back the crowd. It seemed the aim of the Cornish to stop the fight and proclaim their man victor.

The Irish who broke in figured that a riot would give their man a needed breathing-spell. Paddock bent his head to Pete's ear and told him to put up his hands. Pete did so at once. Askew, who was aching to get at him before he could recuperate, tried to fight through to the Irishman, but the crowd in the ring was too dense.

The interruption took several minutes, during which Pete was being showered with water and fanned vigorously.

Finally the ring was cleared and the men faced each other again. Askew rushed in to close the battle, but Pete kept him at bay until there was a chance to go down without much damage. At the end of the round he was back in his corner more like himself again.

Then I saw him reach out and seize the bottle of punch that had been sent him by the wife of the Supreme Court judge. He lifted it to his lips and took a long pull.

"Ten to six on Askew!" came from the Cornish side of the scene.

"Taken for a thousand or any part of it!" came back as Champagne Liz stood up, again shaking her money at the Cornish.

Men Allowed to Scrap in Peace.

While the excitement had reached its climax and died away, as hundreds of Colts which had been flashed in air were returned to their hip pockets, the betting was briskly resumed. As the fight progressed Pete seemed to recuperate and was more careful of his fight than before.

He was recovering his confidence and chopping his man down again when the two closed in a wrestling bout. In the clinch Askew's spiked shoe somehow caught his antagonist on the inside of the leg and tore an ugly gash in the flesh from which the blood spurted.

Claims of foul were raised, but the referee did not dare to stop the fight. His life would have been in jeopardy had he attempted it.

So Pete, bleeding like a slaughtered pig,

was kept at his work with the pistols of Paddock and Hughes constantly flashing behind him.

Presently he closed Askew's eye, and for the first time in several rounds the Irish were able to send up a yell of delight.

This was in the fifty-fifth round. As the Cornishman's eye went shut Champagne Liz shouted, "Ten to five on Dublin Pete!" There were no takers.

Lasted 3 Rounds after Being Blinded.

Five rounds later the Irishman closed Askew's other eye and the fate of the Cornish champion seemed about determined. The look upon the faces of Askew's countrymen was something for an artist to study.

His defeat meant a world of sorrow to them. Every dollar that some of them had was staked on him. If he went down the Irish would have the championship and could strut on the streets of Virginia City and crow over the victory.

However, in spite of the fact that Askew was blinded in both eyes it took three more rounds to finish him. When felled to the ground like a bullock in the shambles he would rise and put up his hands, game to the last.

A blow in the temple finally ended the battle. Askew tottering, sank down slowly, and on reaching the ground utterly collapsed and lay sprawling on his face as the referee counted him out.

"Erin Go Bragh!"

Here the Irish broke into the ring and lifted their victorious countrymen on their shoulders. Some one handed him an Irish flag, which he waved in triumph. Thus ended about the longest and bloodiest ring battle ever fought in the West.

While these demonstrations were in progress the sheriff of Washoe County arrived and made an attempt to arrest the victor and his seconds. A dozen pistols were flashed in his face and he was told that he had better get home. Having no deputies he retreated. He had tied his horse to a mountain cedar on his arrival, but when he went to look for the animal it had disappeared. A reporter of the *Evening Chronicle* had mounted it and was already half-way to town with the notes of the fight. The sheriff had to walk nearly three miles to recover his steed.

In the mean time Champagne Liz was circulating among the Cornishmen collecting her bets. There was no welching in those days on the Comstock; so, having borrowed a grip of some friend, she soon had it filled with gold and currency.

Her winnings were roughly estimated at ten thousand. That night she more than sustained her reputation as a champagne drinker. The Irish had been waiting many years to celebrate this sort of a victory and they kept things moving along that line for several days.

Then, to the astonishment of every one, the authorities took a hand in the game. District Attorney Lindsay got out warrants for the arrest of the principals and seconds, as well as for prominent citizens of the ledge.

When Bob Lindsay Wasn't Joking.

This was at first regarded as "one of Bob Lindsay's jokes," for before he was district attorney he had been a stage comedian and burnt-cork artist. Furthermore he had been master of ceremonies only a year before, when a similar mill had been pulled off and the ring had been located in the exact spot where Dublin Pete and Askew had fought.

On the prior occasion Lindsay had insisted that the ring had been located in Washoe County; but he now claimed that he had been only bluffing. To prove Lindsay's contention that the fight had been put on in Storey, the county surveyor was called in and when he located the line it showed that Lindsay really did have jurisdiction.

The grand jury was in session, and all the reporters on the Comstock were brought before that august body for examination.

None of us apparently could remember

seeing any prominent citizen at the fight. We all excused our presence there on the grounds of professional duty. We were promptly sent to jail for contempt of court, and for a week while in confinement were regaled on terrapin stew, truffles, turkey, oysters, and cigars.

The sports vied with each other to see that we lacked for nothing. When a basket of wine arrived accompanied with flowers we knew that Champagne Liz was remembering us. We were called before the jury every day, and, after being fruitlessly examined, were remanded to the custody of the sheriff and taken back to the "cooler."

Finally the foreman of the jury remarked that if we were kept in jail much longer he feared that we would forget our own names. After reprimanding us in a serious speech the court then dismissed the charge of contempt and gave us our liberty.

The joke of the thing was that the judge himself and every member of the grand jury attended the fight.

Gunplay Closes the Tale.

Askew, humiliated and disgraced at his defeat, fled the Comstock, and Dublin Pete was put under $10,000 bonds. His backers and seconds, Paddock and Hughes, went on the bond. The day after the grand jury adjourned and reported their inability to secure sufficient evidence to indict any one but Pete and his backers the curtain went down on the whole affair.

But a more tragic aftermath was to come. About two in the morning Officer McDonald arrested a man for disturbing the peace in the Delta Saloon, the leading gambling-resort of the city.

As he did so Paddock and Hughes ordered him to take his hands off the man or they would "shoot somebody's eye out." This was their favorite threat and it was generally effective.

The officer replied that he was discharging his duty and warned them not to interfere. They both reached for their weapons at the same time, but McDonald was too quick for them and shot them both through the body.

His revolver cracked twice and the two shots were but the fraction of a second apart. The men fell across each other like two sticks of cordwood and were dead when they reached the floor.

McDonald made his way through the crowd and took his man to the station-house

Dublin Pete was close to the scene of the tragedy. Coming in with the crowd, he turned the faces of the dead men up to scan them.

Seeing that they were his bondsmen, he asked a bystander what he had better do under the circumstances.

"Hit the Geiger Grade," was the laconic reply.

Dublin Pete hurriedly explained that he had no intention of leaving any one in the lurch financially and that if his going involved any financial loss to the heirs of his bondsmen he would return immediately on a wire sent to him in care of the *Clipper* office, New York.

He started out on the run over the grade. It was twelve miles to Reno, where he could board a Southern Pacific train east-bound.

He caught the Overland Express; and after the interment of Paddock and Hughes the incident was considered closed.

THE G. P. A. SAYS:

Do not scorn the lowly passenger.
Where he isn't, freight doesn't go.

FROM THE RAILROAD MAN'S MAGAZINE.

The Sunny Side of the Track

JUST as the tramcar started, two women rushed from opposite sides of the road to meet and greet each other right in the middle of the tram-lines.

There they settled down to a long chat, and, of course, the tram stopped. They talked and talked, while the car awaited their pleasure. Presently the passengers on top began to make sarcastic remarks.

Then the driver stepped into the breach. Bending over the front of the vehicle, he said, in the gentlest of tones:

"Pardon me, ladies, but may the conductor and I bring you a couple of chairs?"—*Royal Magazine.*

SANDY McNAB (to porter who has put all the heavy luggage into the van): "Mon, I consee-der you've been verra obleegin'. Will ye tak' a pinch of snuff?"—*To-Day.*

GEORGE BERNARD SHAW, the brilliant author and playwright, tells this story of a cricket-match which took place in his native town not long ago.

"The match, Married *vs.* Single, was in progress," avers Mr. Shaw. "The 'Married' innings had closed with a total of thirty-seven, toward which Jones, the local grocer, had contributed a lucky twenty. Scarcely had the 'Singles' commenced to bat when the startling news of a local train-disaster reached the ground, whereupon Jones evinced a worried look

"'What's the matter, Jones?' queried the captain.

"'Well,' Jones replied reflectively, 'my wife was on that train.'

"'Too bad, old man; I'm sorry,' murmured the captain, greatly touched. 'In that case, of course, you want to get away at once'

"'Oh, no; it isn't that,' explained Jones. 'But, you see, if anything has happened to Annie I ought to be playing for the single chaps.'"—*Lippincott's.*

A RAILROAD official in great need of extra hands following a washout finally asked Bill Smith, who was accounted the town fool, if he would help out

"Wha'll ye pay?" asked Bill.

"I'll pay you what you're worth," answered the official

Bill scratched his head and announced decisively:

"I'll be durned if I'll work for that!"—*Exchange.*

A COLORED auntie was taking her first ride on a fast train when it jumped the track and plunged headlong into the ditch. After the crash "auntie" picked herself up and began munching a chicken wing she had brought along for sustenance. The conductor hurried up to ascertain the damage.

"Were you hurt in the smash-up?" he asked excitedly.

"Law, no," she replied in astonishment. "Wuz there a smash-up? I to't dese yere combustifications went right along wif de ticket."—*Argonaut.*

"CHARLEY, dear," said young Mrs. Torkins "I am going to be in favor of government ownership."

"Have you given the matter any thought?"

"Yes, indeed. If we had government ownership of railroads I might be able to tell any conductor who didn't find me a seat on the shady side of the car that I wouldn't vote for him next election."—*Washington Star.*

A TRAVELING-MAN one night found himself obliged to remain in a small town on account of a washout on the railroad caused by the heavy rain, which was still coming down in torrents. The traveling man turned to the waitress with

"This certainly looks like the flood."

"The what?"

"The flood. You've read about the flood, and the ark landing on Mount Ararat surely"

"Gee! Mister," she returned; "I ain't seen a paper for three days."—*Harper's.*

PATIENT: "But, doctor, you are not asking five dollars for merely taking a cinder out of my eye?"

Specialist: "Er -no. My charge is for removing a foreign substance from the cornea."—*Rehoboth Sunday Herald.*

MEBBY you don't know it, and mebby you don't care a hoot. But anyway, A. M. Six, the B. and O. day ticket-agent at Wheeling, West Virginia, goes to work at Six A. M.—Cumberland (Maryland) *Times.*

BIGGEST EXPORT COAL-PIER—

THE NEW COAL-PIER JUST BUILT BY THE BALTIMORE AND OHIO IN BALTIMORE HARBOR IS THE LARGEST IN THE WORLD FOUR VESSELS CAN BE LOADED SIMULTANEOUSLY WITH CARGO COAL AND BUNKER FUEL, THE WHARF'S CAPACITY BEING 7,000 TONS AN HOUR

A VALUABLE asset to the nation's facilities in time of war is the new export coal-pier constructed recently by the Baltimore and Ohio Railroad at Curtis Bay, in the Baltimore Harbor. This enormous structure, the largest of its kind in the world, can load four vessels with cargo coal and bunker fuel at the same time.

It represents a new departure in the construction of this class of railroad terminals in that the objectionable feature of breakage is overcome by a system of handling the coal mechanically. The maximum fall of the coal from the time it leaves the cars until it reaches a vessel is three feet.

The new pier has a capacity of 12,000,000 tons a year, or 7,000 tons an hour, and was built at a cost of $2,500,000. It will doubtless be one of the busiest and most important coaling-stations in the country, and will be kept under close guard day and night.

This pier is the first of its type ever built. Constructed of concrete and steel, and operated electrically, it consists of two car-dumpers at the land end, and a concrete deck eight feet above mean tide. On this deck are four loading-towers and two trimming-towers to which coal is delivered by belt conveyers from receiving-hoppers at the car-dumpers, or from the balancing-bin interposed between the dumpers and the pier.

The pier is in two units, a car-dumper, two loading-towers, and a trimming-tower comprising a unit. Each dumper handles sixty 50-ton cars, or forty 100-ton cars an hour. The pier will handle a car fifty-four feet in length.

Cars Turned Upside Down.

The tracks leading to the dumpers are on a descending grade, cars running to the barney pit by gravity. The barney pushes the cars up a ten per cent grade to the cradle of the car-dumper. After the car is placed on the cradle, it is clamped and turned upside down, delivering the contents to a counterweighted apron.

There are three belts to each car-dumper, the belts being 60 inches in width, with a capacity of 2,000 tons an hour and running 500 feet a minute.

B. & O. OPENS $2,500,000 WHARF.

BREAKAGE, ALWAYS A SERIOUS PROBLEM IN COAL LOADING, HAS BEEN OVERCOME BY MEANS OF A LOWERATOR ATTACHED WHEN LUMP-COAL IS BEING HANDLED THE LOWERATOR DEPOSITS IT IN THE VESSEL WITH A DROP OF BUT THREE FEET

The loading-towers are equipped with a cage supporting a shuttle ram. The cage is raised or lowered to suit the height of the vessel being loaded, thus providing further precaution against breakage to the coal.

The two trimming-towers, located on either side of the pier, have belts 48 inches wide, with a capacity of 1,500 tons an hour when traveling at a speed of 500 feet a minute. Coal for these belts is taken from the balancing-bin.

Cargo and Bunker Coal Loaded Together.

While the loading-towers are working on the cargo, the trimming-towers are loading the bunker coal. After the loading-towers have finished their work, the trimming-tower finishes the slow work on the vessel, thereby releasing the loading-towers to work on another vessel.

The functions of the pier are interlocked and controlled electrically with push-buttons on each belt-conveyer runway. By pushing a button, all movable parts of the belt, tower, and feeders are stopped.

The operators are situated in houses on the shuttles. They first start the shuttle belt, and when this is running at full speed the main belt automatically starts, and when at full speed the feeders also start automatically. A master control of the pier is located in the superintendent's office, enabling him to establish the maximum speed at which the belts are run. Another device to avoid breakage is a lowerator which will be attached when lump-coal is being loaded. The lowerator deposits coal in the vessel with a drop of but three feet.

Two tracks leading to the car-dumpers are covered by a steel-and-concrete thawing-shed with a capacity of 22 cars, into which cars are placed in severe winter weather. Coal placed in this house, where the temperature is kept at 180 degrees for thirty minutes, will thaw out sufficiently to free itself. Both the thawing-shed and car-dumpers are operated by steam.

The methods used for the handling of coal at the Curtis Bay pier were the invention of Francis Lee Stuart, who was chief engineer when the pier was designed and the construction begun.

WE WANT ODD PHOTOS.

IF you see a photograph relating to the railroad, the telegraph, or the telephone that interests you, the chances are that it will interest somebody else. So send it in to us, and if it has sufficient general appeal we shall be glad to pay you promptly for it.

In the table of contents you will find a number of single photographs, listed under the general head of "Miscellany." Look over these pictures, in this and preceding issues. They will give you a general idea of what we are after. But, to be more specific, the types of photographs which appeal especially to our readers are:

> **The new, the novel, the quaint, the historical, the unique, the surprising; in general, anything which shows the resourcefulness and the adaptability of the human mind, or the skill and the daring of the doer. These photographs must apply to some phase of railroading. Views of old curiosities in equipment are always welcome, likewise pictures of extraordinarily difficult railway construction.**

Each photograph should be accompanied by brief explanatory matter.

In sending in the pictures, be sure that they are photographs —real photographs. We can't use half-tone reproductions, etchings, prints, etc.

We don't care how the photos are mounted in fact, it makes no difference to us if they aren't mounted at all but we would like the negatives to be as clear in outline and as large as it is possible for you to make them. Put a piece of cardboard or other stiffening in the envelope, so that the picture will not be torn in the mails. And always enclose full postage for return in case your offering proves unavailable.

Come on, boys, get busy with the family camera, send in everything that looks good, and we'll pay you for everything we can use. Address EDITOR, RAILROAD MAN'S MAGAZINE, 8 West 40th Street, New York.

THE THROTTLE WIDE OPEN.

The Railroads Are Making Money and Spending Money as Never Before in All Their History.

Grand Trunk has ordered 15 superheater Mikados.

Union Tank Line has ordered 2,000 tank cars so far this year.

New York Central is to spend $15,000,000 for new equipment.

Lima Locomotive Works are making 90 engines for New York Central.

The Bibb Belt Railway, to serve Macon, Georgia, has been chartered.

Chicago, Burlington and Quincy is asking around for 6,000 tons of tie-plates.

Forehandedly the Père Marquette has ordered 10,000 tons of rails for 1918 delivery.

New central power-house at Omaha, Nebraska, is costing the Union Pacific $450,000.

Chicago, Milwaukee and St. Paul has ordered 250 flats and 250 freezers from Bettendorf.

American Steel Foundries' gross sales in 1916 were $31,361,006 or three times its 1915 figures.

United States Steel's pay-roll last year increased 49 per cent over the previous twelvemonth.

Boston and Maine has raised its telegraphers and given them an annual vacation of a week.

Southern Railway is putting up a combination station 123 feet by 41 feet at Alcoa, Tennessee.

Baltimore is to have a new warehouse, 40 feet wide and 200 feet long, thanks to the Pennsylvania.

New freight terminal 300 feet long is being built by the Lehigh Valley at Hazleton, Pennsylvania.

Chicago and Northwestern has ordered twenty Mikados from the American Locomotive Company.

Jacksonville Terminal Company is putting $750,000 into a new passenger station at Jacksonville, Florida.

American Locomotive Company is making forty superheater Mikados for the Northern Railway of Spain.

Constantine Refining Company has ordered ten tankers from the General American Tank-Car Corporation.

The Ringling and Oil Fields is extending its line from New Healdton, Oklahoma, to the Fox oil-fields, 8 miles.

Seventy-mile electric line from Columbia, South Carolina, *via* Lexington to Saluda, according to present plans.

American Steel Foundries made net profits of over 23 per cent last year. In 1915 it earned only 0.0017 per cent.

Buffalo, Rochester and Pittsburgh is

looking after the boys at the hind end. It wants prices on twenty cabooses.

Chicago and Northwestern is inquiring for 50 locomotives and 2,000 100,000-pound capacity composite gondola cars.

Burlington is requesting bids on grading and hauling material for a 46-mile line between Moberly, Missouri, and Monroe City.

Chicago Pneumatic Tool Company made $953,422 net on its last year's business, as compared with $533,247 in 1915.

Pine Bluff and Northern will extend from its present terminus at McCreanor, Arkansas, to Pine Bluff, about thirty-five miles.

Must be using up locomotives fast in France. Northern Railway of that country has just ordered fifty more Mikados from Baldwin.

Grading work has been completed by the Christie and Eastern on the line from Shreveport, Louisiana, to Longleaf, sixty miles away.

Harney Valley Railroad has been incorporated to build a line from Bend, Oregon, through Burns, to Klamath Falls and San Francisco.

Operating income in 1916 increased 19.9 per cent in the eastern district, 37 per cent in the southern and 23.1 per cent in the western.

Louisville and Nashville has given the Bettendorf Company an order for 1,000 underframes for freight-cars which it will make in its own shops.

Northern Pacific is working on a freight-line between Logan, Montana, and Bozeman, 33 miles, to have a grade of 0.4 per cent and to cost $2,000,000.

Rail exports for the eleven months ending the 1st of last December were 499,224 gross tons, thus surpassing the 1913 record by nearly 40,000 tons.

Grand Trunk is thinking about buying twenty-five locomotives. Wake up, G. T.; order first and think afterward if you want to get 'em in these piled-up days.

Chicago and Northwestern's telegraphers are receiving 9 per cent more money. Some 2,000 men are affected; the increase costs the company $150,000 a year.

Los Angeles and Salt Lake is constructing a 25-mile line from Pico, Los Angeles County, California, through Whittier, Fullerton, Orange County, and Anaheim to Santa Ana.

Pennsy is getting right after the construction of two tunnels—one 300 feet long, the other 350 feet—on the Wheeling Coal Railroad a few miles east of Elm Grove, Pennsylvania.

Construction contract has been awarded by the Winchester and Western for a line from Winchester, Virginia, to Wardensville. A circuitous route makes the distance thirty-five miles.

United States Steel Products Company is filling an order for $467,000 worth of rails, angle-bars, track-bolts, and spikes, that has been placed with it by the Alaskan Engineering Commission.

Philadelphia and Reading, Wheeling and Lake Erie, and Michigan Central have each ordered 5,000 tons of steel rails, while the government railroad in Alaska has ordered 10,000 tons.

Things are so prosperous with the Lehigh Valley that its officials are working out the details of a project to spend between fifteen and twenty million dollars for electrification of 228 miles of line.

RAILWAYS ARE GETTING SAFER.

But Accident Rate among Trainmen Is Still as High as the Highest in Other Lines, These Figures Show.

THE actuaries of the great insurance companies, whose responsibility for accurate mortality statistics may be judged from the fact that upward of forty billions of insurance is in force in this country, say that in 1916 there were approximately 22,000 fatal industrial accidents in the United States and 260,000 serious injuries.

Peaceful pursuits, in the name of industrial progress are almost as costly in human life and limb as war.

There was a time, before the days of "safety first," when the railroad was the most dangerous instrument in industrial life, but to-day there are many industries in which, of the total number of employees engaged, the average death and injury rate exceeds that of the interstate steam railroads.

The accompanying charts, prepared by experts, show the condition.

"Average Railroading" Is Safe Job.

The average railroad man — that is, considering the estimated total of 1,700,000 employees of railroads — is safer in life and limb than the average metal miner, coal miner, fisherman, navigation employee, electrician, quarryman, lumberer, member of naval and marine corps, American soldier or building and construction employee.

The average drayman and teamster and street railroad employee is just a

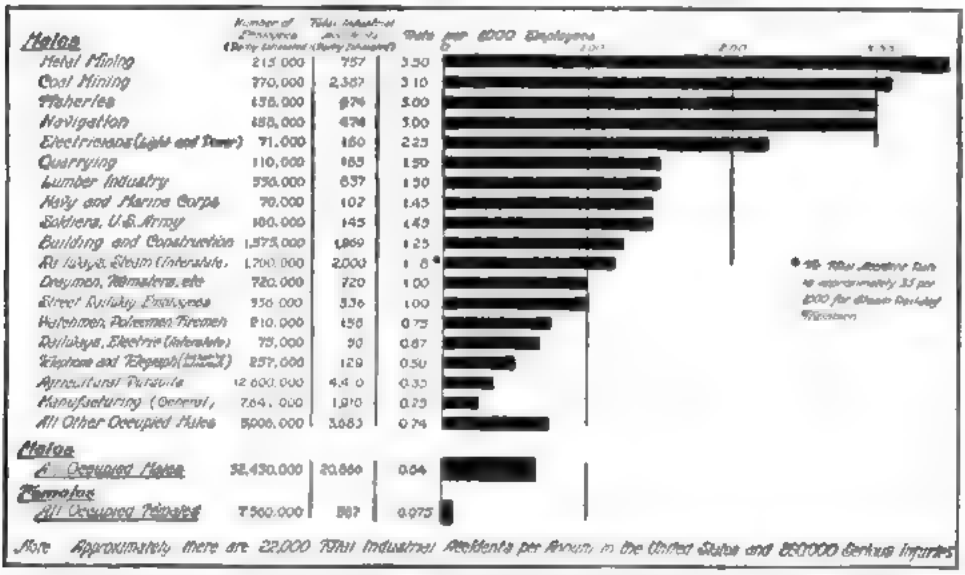

Males
Metal Mining 215,000 757 3.50
Coal Mining 770,000 2,387 3.10
Fisheries 436,000 976 2.00
Navigation 488,000 674 2.00
Electricians (Light and Power) 71,000 160 2.25
Quarrying 110,000 165 1.50
Lumber Industry 550,000 837 1.50
Navy and Marine Corps 70,000 102 1.45
Soldiers, U.S. Army 100,000 145 1.45
Building and Construction 1,375,000 1,719 1.25
Railways, Steam (Interstate) 1,700,000 2,000 1.18*
Draymen, Teamsters, etc 720,000 720 1.00
Street Railway Employees 536,000 536 1.00
Railways, Electric (Interstate) 75,000 90 0.87
Railways, Electric (Intrastate) 257,000 129 0.50
Agricultural Pursuits 12,600,000 4,410 0.35
Manufacturing (General) 7,84 . 000 1,920 0.25
All Other Occupied Males 5006.000 3,683 0.74
Males
All Occupied Males 32,430,000 20,860 0.64
Females
All Occupied Females 7500.000 887 0.075
Rate per 1000 Employees
0
1.00
2.00
3.33
* '16. Total Accident Rate is approximately 35 per 1000 for Steam Railways Western
Note Approximately there are 22,000 Fatal Industrial Accidents per Annum in the United States and 260000 Serious Injuries

CHART No 1—FATAL INDUSTRIAL ACCIDENTS ESTIMATED FOR U S FOR 1916.

METAL MINING IS THE MOST DANGEROUS OCCUPATION FOR THE GROSS NUMBER EMPLOYED, THOUGH TRAIN-SERVICE EMPLOYEES SHOW AS HIGH A PROPORTION OF CASUALTIES PER THOUSAND

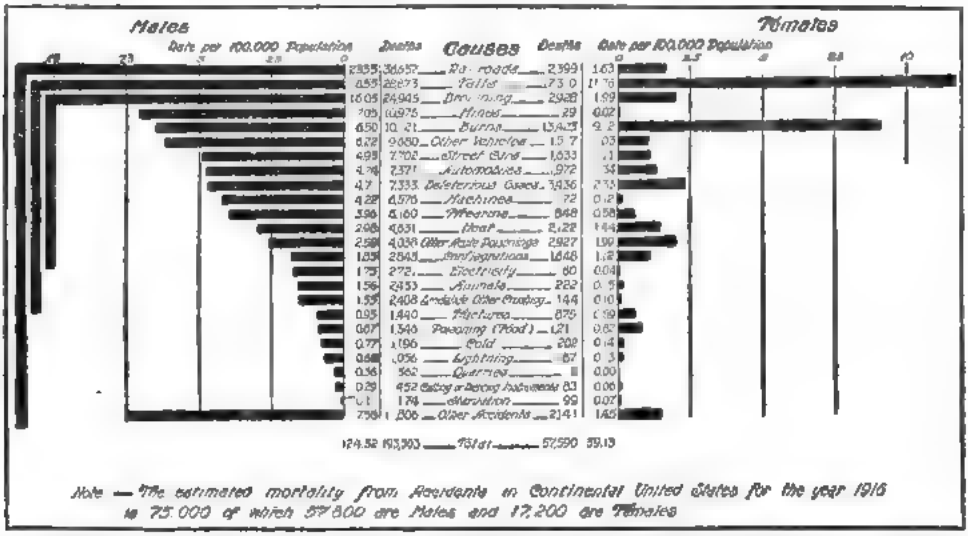


CHART No. 2.—MORTALITY FROM ACCIDENTS, U. S. REGISTRATION AREA, 1910-1914.

THE RAILROAD CAUSES A FAR GREATER NUMBER OF VIOLENT DEATHS THAN ANY OTHER ONE THING. STARVATION—IF THAT BE AN ACCIDENT—TOOK OFF 273 PERSONS.

little more secure from accident than the average railroad man, according to these figures.

It is not, however, fair to make these comparisons on the basis of total men employed by the railroads, for manifest-

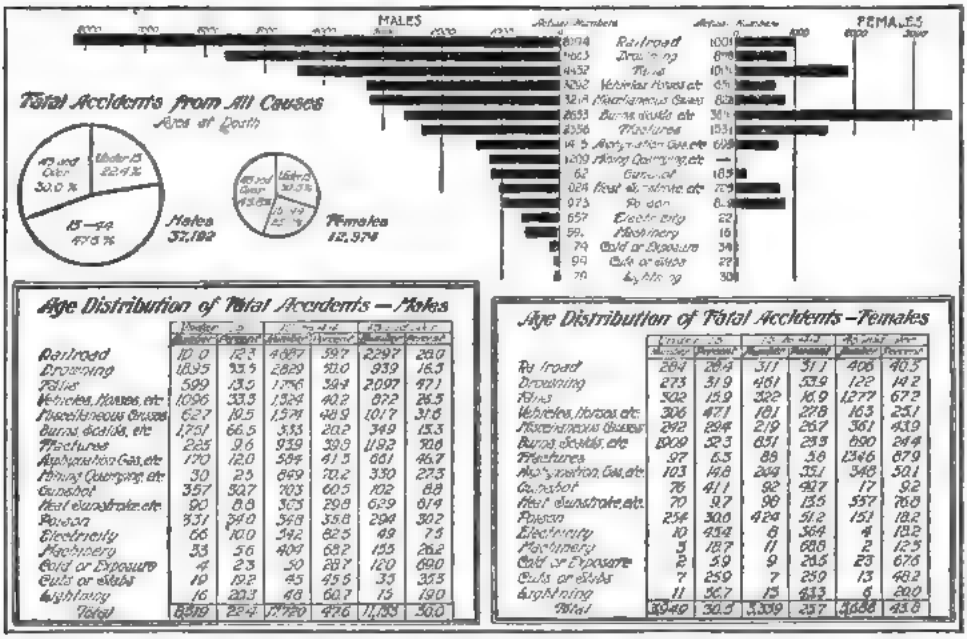


CHART No. 3—MORTALITY FROM ACCIDENTS; INDUSTRIAL EXPERIENCE OF AN INSURANCE COMPANY, 1906-1915.

FIGURES COMPILED BY THE PRUDENTIAL, THROUGH WHOSE COURTESY ALL THESE CHARTS ARE REPRODUCED, AGREE WITH THOSE OF THE GOVERNMENT IN SHOWING THE RAILROAD AS THE GREATEST SINGLE CAUSE OF DEATH BY ACCIDENT.

ly the majority of the employees are not exposed as are the trainmen, and the fatal-accident rate among steam-railroad trainmen is admitted to be 3.5 per 1,000 individuals, which is as high as the highest rate in any trade.

Reference to Chart No. 1 will clearly show how metal mining, per thousand employees, is the most dangerous occupation for the gross number employed in the various branches of industry. General manufacturing appears as the least hazardous of the specified trades.

Of all occupied men and boys in industry, numbering 32,430,000, the number killed in 1916 is given as 20,866. Of 7,560,000 girls and women engaged, 567 met with fatal accidents last year.

Chart No. 2 shows mortality from accidents from the insurance-registration area of the United States for the period from 1910 to 1914. This also gives an estimated mortality from accidents in continental United States for the year just passed of 75,000, of which 57,800 were males and 17,200 were females.

Rail Accidents Big Death Factor.

So far as males are concerned, the railroad is by far the chief cause. Over the period covered by this chart it is shown that 36,657 men and 2,399 women met death through railroad accident. No other industry claimed such a terrific total.

Of course, these figures are general and include every accident resulting in death that happened on all of the railroads of the country, from deaths in wrecks to the deaths resulting from seemingly slight accidents and all of the vast number of persons killed while trespassing on railroad rights of way.

It is interesting and important, perhaps having relation to the shoes that women wear, that by far the greater number of women in fatal accidents, as shown in Chart No. 2, were the victims of falls. No less than 17,310 women and girls died as the result of accidental falls.

A great number of men and boys are fatally hurt in that manner, too. In fact it is the second great cause of accidental death.

The third is drowning, and 4,495 males and 2,928 females met death in that manner.

Mining claimed 10,975 males and 29 females.

The second greatest accident peril of womankind is fire, and 13,423 of them and 10,121 men and boys died as the result of burns in the period prescribed in the chart.

Street-Cars More Dangerous Than Autos.

The automobile is dangerous, but not so dangerous as street-cars or other vehicles. The automobile claimed the lives of 7,371 males and 1,972 females in the chart term.

At the bottom of the list, thanks to a country abounding in wealth, comes death due to starvation. It is amazing that any one could starve to death in the United States, but the fact seems to be that 174 males and 99 females did die in that terrible manner.

Doubtless individual peculiarities would explain away the mystery in most of these cases. For instance, a woman and her children were found starving in their home near New York City recently. It was found that she had been deserted by her husband and, although well-connected, with plenty of friends she might have called upon, she chose death by starvation rather than the humbling of pride by asking for succor.

Perhaps there are many such cases which would explain the figures stated herewith. There may be actual cases of persons dying for food, even when they have asked for aid, but it is difficult to imagine circumstances of that sort in a land of plenty.

Chart No. 3 represents the experience of the Prudential Insurance Company from 1906 to 1915.

It shows as the predominating cause of fatal accidents the railroad, with 8,194 males and 1,001 females as the victims. The second cause in the experience of this concern is drowning, and the third is falls.

A feature of this third chart is the revelation that among males 47.6 per cent meet fatal accidents between the ages of 15 and 44 years. Among women, 43.8 per cent 45 years and over are accidentally killed.

Fewer boys than girls, under 15, suffer accidents which cause death. The percentage for boys is 22.4 and that of girls is 30.5.

Age distribution of fatal accidents among males, with the railroad as the cause, is as follows: Under 15 years, 12.3 per cent; 15 to 44 years, 59.7 per cent; 45 and over, 28 per cent.

By the time men reach middle life they realize the danger of the water, the statistics show, for while boys under 15 are drowned to the extent of 33.5 per cent and boys and men from 15 to 44 years die in the water to the extent of 50 per cent, men 45 and over who die thus number only 16.5 per cent.

The chart indicates that most of the women who die in railroad accidents are between the ages of 15 and 44. Of the women dying from falls 67.2 are 45 years or older.

THE FLAGMAN.

BY JOHN G. GARTLAND.

SUNNING himself like a sheep-dog,
Stretching his old wooden peg,
Keeping his watch o'er the crossing
That cost him his own good leg,
Warning the passers of danger,
Safeguarding soft, human clay,
There on his bench by the shanty
Sits the old flagman all day.

WARDEN of legend and story,
Woven by toil and by time
Round his old true-love, the railroad,
Blended with blood and with grime,
Compassed by awe-stricken youngsters
Drinking in each episode,
There he sits puffing his corncob,
Telling them tales of the road.

SPRING, summer, autumn, and winter,
Gnarled, crippled, sunny of mind,
Spry as a cricket when danger
Rides on the wings of the wind,
Year in and out he is sitting,
Gazing on rail and on tie,
There on his bench by the shanty,
Watching the wide world go by.

THE WIRE-TAPPER.

How the Bookmakers and Touts Were "First-Pasted," and Why the Thief Wasn't Deprived of His Winnings.

BY WILL SEBELLE.

"SEE me—R. H."

That was all the note said. William Harrigan, after one glance at it, looked up at the relief operator standing near his sounder who had brought it.

"All right, George; sit in," he said. "I'll go see what's troubling the old man."

On his way to the chief operator's desk, in spite of the staccato din of hundreds of instruments he pondered the meaning of that terse, peremptory note. It foreboded evil. Many times had he seen such notes delivered and as many times had he seen operators, fear blanched on their faces, leave old Hennessey's desk, punch off and go down-stairs for their pay-checks.

He felt that the eyes of every one—even the checks-girls — were upon him, and there entered into his mind a sympathetic feeling for those who go to their execution. A smile lit up his lean face. At least there would be no cringing on his part, no apathy of despair upon being cast adrift—if adrift it was to be.

He reached the little railing that encircled the platform on which the chief operator had his desk. The bald pate of Hennessey was bent over a few papers.

"You sent for me, chief," Harrigan announced. "What do you want?"

Hennessey looked up, laid his pen aside, adjusted his glasses with both hands and stared for a few seconds. Then he blurted:

"I want to tell you that there are too many leaks here in the operating-room."

There was an irascible snap to his voice. Noticing the expression that came over Harrigan's face and the ominous look that shone from his eyes, he hastened to add in a whining way:

"I want you to help me run the affair down. The complaints are getting on my nerves."

Harrigan drew a long breath of satisfaction. The drastic demonstration he had decided upon a few moments before was unnecessary; the combative glint faded from his eyes; his smile came back.

"I thought you were about to involve me by implication," he remarked. "Thought I was about to get what poor old Newton Rhoades got a few months ago. How can I be of any help to you?"

"Step inside and sit down, Bill. I'll tell you."

The ordeal was over, so far as Harrigan's sense of dignity was concerned. The fact that he had entered the almost sacred enclosure, had passed into the inner shrine of telegraphdom, precluded the anticipated dismissal that so many were watching to see.

He looked about from his elevated position. Many, he knew, were disappointed; had keyed themselves to see a quiet, dramatic action unfolded, such as had taken place six months before when poor old withered and bent Newton Rhoades staggered away from the railing with tears glistening in his eyes and fear on his face,

a sight to harrow the souls of men. He saw many eyes diverted from him, saw them concentrate once more on their sending and receiving

Hennessey finished fumbling in his desk. He turned in his swivel chair, hooked his thumbs under the arm-holes of his vest and slid aslant into a lazy position.

"I understand, Bill," he said, "that you are quite an investigator of criminal cases; that you put in all your spare time reading theories, hobnobbing with the police and in snooping about the dark corners of the city?"

"I do a little investigating — as an avocation," Harrigan replied, and he wondered what old Hennessey would say could the chief operator but see the way his room was littered with volumes on criminal research and his laboratory of finger-prints and mementoes of cases on which he had worked with the police and reporters.

Also he wondered what old Hennessey would say could Hennessey but spend an afternoon with him strolling through the different departments of the Hall of Justice where he could impress upon Hennessey his *entente cordiale* best by lingering in Chief of Police Quigley's office and smoking one of the police chief's cigars.

There was a certain love of the grandiose in Harrigan. He would like to take Hennessey for a trip throughout the purlieus of the Hall and show him where to find a level below the sodden.

"Then I wish you would cut in on this case," the chief went on. "The whole operating-room is under suspicion—has been for some time. Every one is suspect. I've had the manager and superintendents on my neck for days.

"Everything is at loose ends. Brokers, exchanges, and the Inland News Service have been soaked for thousands—particularly the Inland News. All through leaks. I have watched and schemed and tried every way to stop them, but they continue. You try, Bill."

The whine crept into his voice again

"Try your best. They're after me pretty hard on this," and Harrigan detected in Hennessey's eyes that furtive, haunting look of fear of the unknown that had glistened into space from old Newton Rhoades's eyes when he was dismissed.

"That dirty crowd deserves all the bad luck they get," Harrigan sneered. "I know them and their graft, chief. 'Inland News Service' looks nice in gold letters on their door, and makes a good stall, but their real business is selling race-returns.

"They have about fifty magneto phones to saloons, blind poolrooms and dives where betting goes on against the law. They pay for instantaneous returns.

"As you know, the winners are flashed to them, and then they crank a handle and shout to all subscribers at the same time."

"All I know, Bill, is that the Inland News Service gets a large file daily. We handle it. What they pay for it and what they do with it don't interest me a bit.

"They're entitled to protection. If we've got any one in the service who is lifting the information, who has a system of selling it or using it with others for betting purposes, I want to find it out."

"Of course you do, chief. I will be glad to look into the matter. Some other clique of trimmers might be bringing in a similar service over the lines of our competitors—in fact, there are five or six different ways they could be hit, and, like all thieves who have occasion to telegraph, the first thing that goes wrong they blame the telegraph company, put the burden of proof on it and throw suspicion on hundreds of honest people. I know the breed."

"Run it down, Bill," urged Hennessey "Use your own discretion about reporting and the hours and wires you work. I want you to be unhampered."

Harrigan arose. The first act of unrestraint he exercised was to extract a cigarette from his case. It would be a fitting climax to his interview to let every

one see him nonchalantly smoking a cigarette in that dreaded place.

Too, it would test the extent of the latitude given him by Hennessey. As he struck a match to it, the old chief, a look of surprise flickering in his eyes, reminded:

"You said something a few minutes ago about expecting to get what old Rhoades got. Nobody is dismissed without cause, Bill.

"I let old Rhoades out because he was worthless. He got so he'd sit around like he was dead, making 'bulls' and smelling of opium. His gray hairs, the two motherless stepdaughters he had to support, his Bible and all that don't count in this business.

"Understand, Bill, that kind of stuff don't figure. I had to fire him."

"It was certainly too bad," Harrigan said as he left the platform.

For days he worked the way wires, keeping the sharpest possible lookout for leak sources. He watched every one, operators, check-boys and girls—all, even janitors, file-clerks, and bookkeepers—and never a suspicious movement rewarded his vigilance. To the contrary, came a siege.

Poolrooms, bookmakers, and touts were "first-pasted" (the winner bet on after the race is run) all over town, banged on long shots at short intervals, and a number of small, mediocre newspapers broke into the limelight with extras on long-distance news sensations — got the news and flashed it before the big dailies and press associations.

There occurred to Harrigan an appreciation of what old Hennessey had said. Everything seemed to be at loose ends. It was obvious that the filched information was leaking from his company. Its text, tone, and the points from which it came settled it in his mind. He was perplexed.

Eliminating the human element in the operating-room, he took up the mechanical; and he perceived in it a stupendous task. Many wires passed through the operating-room that might be carrying information to a distant, inconceivable leak.

There were leased wires to newspapers and brokers' offices, branch wires, loops to special telegraph departments in big commercial houses—leads in every direction.

He decided that the leaking information was being gleaned from without. As a result of a process of elimination he chose a leased wire to the office of a banker and broker and "rode" it, copied every word that went over it, sent and received, from the first thing in the morning until the last thing in the afternoon.

He recalled his personal observations of leased wires. Many times he had listened to messages going over them in flagrant violation of the terms under which they had been leased, and in a few instances he knew of private-wire operators who had "flashed" certain extraneous matter to each other to their own unscrupulous financial gain. At the end of a week his brain serried with a conglomeration of abbreviated stock terms and figures, he decided nothing was amiss.

He shifted his investigation to the newspaper wires. The first to draw his attention was that of the *Herald*, which was, that paper claimed, "the longest leased wire in the world." The *Herald*, being a morning paper, used the wire only from five o'clock on in the afternoons.

A sudden desire to know what use his company made of that wire daytimes possessed him. He kept close to the wire chief to find out, watched the wire-chief plug it in on the switchboard to different long-distance points — anywhere where a superabundance of business was to be "cleared." At twelve o'clock Harrigan was agreeably surprised to see the wire-chief cut it off the Chicago circuit and plug it in on Butte to bring in the race service.

"Do that every day?" he asked.

"Sure. Why, Bill?"

"Nothing. Just wondered, that's all."

Leisurely he strolled from the operating-room.

Ten minutes later he was snooping about the telegraph-room of the *Herald*. It was empty.

He heard a faint clicking. The sounder in the resonator was screwed low. Butte was sending the first race

The stuff was carrying through to the *Herald*, but no one was copying it there

Harrigan lit a fresh cigarette, pulled his long-peaked cap down over his eyes and started on the run for the operating-room again

He found the *Herald* wire still plugged-in on Butte. A few feet away from the switchboard the repeaters were singing in one incessant roar.

He bent close to one of them and listened to the short, snappy description stuff that was being sent over the Butte wire in supplying returns for the Inland News Service.

The third race was being "flashed." He smiled as he read the positions of the horses at the start, quarter, half and three-quarter. Butte had just shot the winner over when some one "broke" and asked:

"Wo-wo wins 3d? Ur not rchg hr clr." ("Who wins the third race? You are not reaching here clear.")

The smile faded from Harrigan's face. He knew that "Silent" Brown, who was "taking" from Butte, did not "break." Brown was not that kind of an operator.

Some one in some out-of-the-way place, in some subterranean channel in the depths was tapping the wire, and there came to him a vague suspicion that he knew the sending, had worked with or listened to that operator before. There was a slight quaver to it, a certain characteristic.

From it Harrigan conjured up a mental picture. He compressed his lips and nodded. He heard Butte flash the last race and signal "30." But the break was not repeated.

Preoccupied, wondering where the tapper could be, he secured a city wire-chart. He noted with much interest that the loop which terminated the "longest leased wire in the world" to the *Herald* snaked and twisted sinuously through old conduits through Chinatown, and he guessed as the reason for such a route the question of trouble and expense

It was, Harrigan reasoned, infinitely easier to obtain permits to tear up streets in that section of town to reach the *Herald* in a roundabout way than it would be to wire direct and cross the big, main streets with conduits; also, it cost less.

The mental picture he had conjured up became clearer in his mind's eye. His "hunch" was developing.

Ahead flickered a ray of hope. He knew in which direction to proceed — Chinatown!

It was in the purlieus of the Hall of Justice, reeking in iniquity, a foul part of the city that had been the locale of a number of his investigations with reporters and strong-arm squads from the detective bureau. Chinatown, where the loop snaked and from where, he was sure, the "bk" signal came from.

Harrigan disappeared from the operating-room, stalked out into the night and became a wastrel, a poor unshaved, ill-clad, human derelict of the underworld prowling the streets and alleys of Chinatown, crawling, at times, into its dark nooks and crannies and sinks of degradation.

Days passed. He was playing his "hunch."

At some point on the *Herald* loop in that quarter he felt that a lone telegrapher was at work. Always he followed the course of the wire, desultorily whiling away his time in places where he knew it went ahousetop, or out of a basement into a conduit.

And where his familiarity could not take him, where *entrée* to smoke and sink lower into loathsomeness must be gained by peculiar passwords, signs or raps, he found ample means of introduction. Too, he noted during his drifting, the complexity of it all, the false passages and doors, the semirevolving floors, the veritable prison rooms and the inmates.

His soul grew sick at the lechery he saw, at the implacability of fate. He passed with a faltering, hesitant step, as if under the effects of a soporific drug, from one abomination to another, through an atmosphere flavored with a mixture of opium and joss-sticks with here and there a hint of incense or camphor and pepper.

Late one night he shuffled to an opium den in Washington Alley. He stepped inside the red-placarded, Chinese-lettered hallway in the center of which hung a low, ancient lamp, aflicker with a single, weak-flamed burner.

He walked to the end of the hall and tapped gently, peculiarly. The door opened a few inches. Behind it shone, like a full moon, the round, pasty face of a Chinaman.

Harrigan made a sign.

Without a word the Chinaman turned, led him through the doorway, down a dimly lit flight of stairs, through the same odoriferous reek of the Orient. Near the end of the hall on the subfloor he paused before a door, opened it and bowed Harrigan to a small cuddy-hole room which had, like the stateroom of a ship, two bunks on the wall.

Harrigan noted the deft, unwasted energy of the taciturn attendant. In but a few moves the latter produced a set, adjusted a cupola-shaped glass cover over the tiny flame of a nut-oil lamp, placed a measure of dark paste and a long, bowl-ended bamboo pipe beside the lamp. Then he withdrew.

Sitting there on the edge of the bunk, his cap pulled down over his eyes, his chin resting in his palms, his elbows on his knees, Harrigan was wondering if it would be safe to meander about when his jaded brain was electrified by the faint click of a telegraph-sounder. In two minutes he had his shoes off and was tiptoeing along the darkened hall.

He knew smokers reclined in the rooms he was passing, but how dead to the world they were was another thing. Once he heard a movement and a groan, and clenched his sweat-covered hand over the butt of his revolver. On he went. The clicking became clearer, distinct enough for him to read.

"So he's lifting a long news special, eh?" Harrigan muttered. "Industrious bird, this. Private and race stuff daytimes and news stuff nights."

He cautiously opened a door that loomed shadowily, ghostlike before him. He felt his heart throbbing and his nerves tensing. All the color and lineaments of adventure were there in that vile sink.

It was a stage all set for the dramatic finale, and such a finale seemed ready to break at that moment. He stepped into the room—an anteroom it was, an outpost position, no doubt, for gaming.

The telegraphing was very plain. He stooped before the thin partition, felt the taut burlap and produced his pocket-knife.

After a seeming eternity of time he drew the slit he had made apart and peeked through.

He caught his breath. His hunch was right!

At the extreme end of the room, near a cement wall, at a table, facing him, was old Newton Rhoades, wan-faced, bent. The light was strong in that room. Harrigan saw the blue, vein-ridged, bony hands as they played over the keyboard of a typewriter; saw the sleepy, half-dead look in Rhoades's lack-luster eyes as he listened to the clicking of the sounder on a makeshift table.

Standing at his side, studying the text of the "flimsy" press specials which old Rhoades had rolled from the platen of his "mill," were two Chinamen, cueless, modernly dressed, obese and yellow.

Came the dramatic finale. In trying to shift to a comfortable position Harrigan slipped. There was a scramble. The door was flung open. In the flood of light he saw a wizened form hurtle past.

Harrigan cast all regard for his safety to the winds. He followed the fleeting form through the hallway, up the stairs, up a second flight, and a third.

The third floor was in darkness. Harrigan was groping, confusion and the shrill singsong of Cantonese in his ears, when a draft of fresh air billowed upon him and he saw at the end of the long hall the bent, superanimated wisp of a man at an open door.

Harrigan paused. Rhoades stepped out on to a balcony, into a blaze of light. He straightened up, bareheaded. He was mumbling a few solemn words, and Harrigan had just grasped the situation when he stopped mumbling.

Rhoades's hand lifted to his mouth His knees bowed. He sank in a huddled heap.

"Cyanid!" Harrigan ejaculated, springing to the still form, and kneeling over it, his glance encompassing an envelope that had fallen to the floor where it lay in a spill of white powder. His cap came off

He looked up—at the light. Shining down upon them on a steeple in the near distance was a cross, large, brilliant.

A number of malevolent, pasty faces began to peer from the edge of the light circle beyond the door. He rushed past them, down the stairs and out. From a China exchange on Dupont Street he got Douglas 20 — Police Headquarters; then leisurely, his cap pulled down over his eyes again, a cigarette in his mouth, he sauntered back to the entrance of the opium joint.

He awaited the arrival of the somber wagon and officers, called them by name, showed them to the lighted balcony and gave them the details; went back with them and saw a sleepy deputy coroner blot the finis entry of Newton Rhoades at the morgue.

So Rhoades passed.

Seated within the chief operator's enclosure the following morning Harrigan related the story.

"You see," Hennessey interrupted, "I was right. He was no good. His dope-smoking and religious fanaticism incapacitated him. I'm glad I fired him—"

He stopped abruptly. Harrigan was regarding him with a cold, piercing look

"Chief," he said, "it's pretty good religion, that fanatical stuff, if it makes a man assume and get under a burden like old Rhoades did, if it compels in a man a sacred sense of duty so keen that he provides for the future of two children that haven't a drop of his blood in their veins.

"Old Newt must have been hitting the pipe in that room at some time or other, brooding over his swift descent downward since the death of his wife, wondering how he was going to pay for the support and bringing up of his two little stepdaughters, when he saw the cable-box where the Herald wire passes through the wall to the conduit that takes it underground across the street. Being an operator and somewhat of an electrician, he saw the possibilities of a tap.

"It turned out better than he had hoped. With a few bright Chinamen and criminals he cleaned up thousands, made everything pay that he rolled from his mill, race returns, news specials, private matter—everything.

"I knew his sending the moment I heard it on the repeater that day at the switchboard. The whole thing came to me, even a vision of his terrified, tear-stained face as he looked when he staggered away from this railing. I remembered that he was a 'hop.' It was just a question of referring to the chart to see what route the *Herald* line took through Chinatown and of the following it up till I found him." Harrigan drew from his pocket a photograph of two little girls.

"That's the motive, chief" — tapping the cardboard—"the thing that kept life in that poor old hulk till he made good, till they were provided for—"

"Made good! Provided for!"

The quintessence of surprise was in Hennessey's voice.

"Made good—landed—arrived," Harrigan emphasized. "Those kids are provided for."

He drew a small bank-deposit book from his pocket.

"I snaked the photograph and book from his coat before I phoned for the big, beefy police. I know them, so I managed fo get by with my story without having to dig them up at the Hall. There's a nice, five-figured balance to his credit, chief. There is also a short will on the last page here, duly attested to, leaving every cent to his stepdaughters."

"But you'll hand the photograph and book over to the authorities, Bill," Hennessey whined. "Surely you will."

"Not now," Harrigan snapped. "They can be found quite accidentally, later, after interest in the affair has died out. It's a nice little angle that deserves respect, a little human interest that will serve the little girls better if it is kept out of the newspapers—"

"You're right," Hennessey declared in shrill treble. "I'll stand pat with you on that point. You can report at your wire when you are good and ready. I'm proud of you, Bill, my boy! I'm proud of you!"

"THE OLD GIRL."

BY W. E. NESOM.

OF all the knotty points, of all
The things that puzzle me,
The chief is, why some people call
The locomotive "she."

Its tendency to loaf and shirk
At every tanking sign,
And puff and blow about its work,
Is surely masculine.

No woman ever works in pants,
Or smokes like Old King Cole,
Or, under any circumstance,
Submits to man's control.

No woman gets "lit up" (by rights
An exploit rather shady),
Or tears across the country nights—
At least, no perfect lady.

Perhaps the stylist who imputes
To it the softer gender
Ignores its tougher attributes,
And only sees the tender.

Or can the explanation be
(When every other fails)
That we so very often see
The fast ones draw the mails?

SAFETY CELL FOR ENGINEERS.

PADDED STEEL CYLINDER CONTAINING THE ENGINEER IS HERE SHOWN LEAVING THE ENGINE FROM WHICH IT IS RELEASED AT THE CRITICAL MOMENT BY A LEVER RELEASED WITHIN THE CYLINDER

RAILROAD engineers need no longer lie awake nights wondering what they would do in case of a wreck. Mr. W. A. Uttz, of Waco, Texas, has figured it all out and has perfected a device which takes care of everything Yes, sir, absolutely everything'

The purpose of the new invention is to afford a means of protection for the engineer in the face of an impending collision At the same time it is arranged automatically to set in operation every means for stopping the train that the engineer could utilize if he remained in the cab and sacrificed his life in the wreck.

A cylinder of steel is lined with coil springs and padded thoroughly. It is supported by steel arms that tilt it away from the cab when it is discharged. The present engineer's seat in the cab is replaced by the seat of the cylinder equipment, which works on a groove-and-rod arrangement.

To operate this mechanical polydextrous genius the engineer seizes lever-handles on either side of the seat and gives a strong pull. The mechanism thus operated closes the throttle, sets the air-brakes, sands the track, extinguishes the fire and drops the engineer, seat and all, into the cylinder, which is instantly released from its frame and thrown clear of the train by the pivoted arms supporting it. The device is the subject of several patents.

Mr. Uttz, being a fearless man who believes firmly in his machine, decided to try it out recently. So he built a model engine and equipped it with his life-saving device. A wreck scene was enacted. A good-sized audience was on hand, and excitement was high as the cylinder came hurtling down from the cab. A minute later the engineer emerged, and believe it or not, boys, as you will, but in his mouth was a lit cigarette on which he was puffing just as calmly as if he were sitting over his dinner coffee.

If necessity is the mother of invention, safety is her hobby. Mr. Uttz's remarkable device is only one of a long chain

of surprising contraptions to make travel by rail more secure

For instance, consider the automatic car-detacher, patented as long ago as 1856 by W. O. George, of Richmond, Virginia.

Under each car was placed a rod which stuck out at both ends. When the engineer had a feeling that his machine was going to take the ditch he pulled a lever which worked a spring that operated a chain that set a dingus to whirling that gave the rod a yank that uncoupled the head car

Then the rear end of the projecting stick under the first car bumped the front end of the projecting stick under the second car. This projecting stick worked a spring which operated a chain which—etc.

And so on from car to car. Result: Engine in ditch, cars roll past, one by one, perfectly safe and quite on the iron

Mr. George's invention is not now in use

THE SAFETY DEVICE AFTER LANDING THE ENGINEER IS STILL INSIDE THOUGH THE CYLINDER ROLLED FIFTY FEET DOWN AN EMBANKMENT AFTER BEING RELEASED FROM THE TRAIN

THE ENGINEER EMERGES FROM THE CYLINDER HE IS JAUNTY, UNHURT, AND MUCH PLEASED WITH THE SUCCESS OF THE LITTLE DEMONSTRATION

By the Light of the Lantern

Ask us what you want to know

WE want to be as useful as possible to our readers, but, because of the great popularity of this department, we are obliged to impose certain restrictions. It is limited to the answering of questions of an informative, technical, or historical nature concerning the railroad business and allied occupations only. We cannot answer requests for positions or give information regarding employment. All letters should be signed with the full name of the writer, as an indication of his good faith. We will print only his initials. The editor begs that readers sending in questions will not be disappointed if the answers do not appear as early as expected. It frequently takes weeks to secure correct answers, owing to the complexity of the questions. All questions are answered free of charge. The editor earnestly requests his readers to bring immediately to his attention any errors they may find in this department. He reserves the right to refrain from answering any question.

FASTEST SPEED.

P. F. D., Tottenville, New York.—The fastest speed ever made by a locomotive or train is a question that the editor hesitates to answer, for many of the recorded high speeds of trains are very much clouded with doubt.

However, a train on the Plant system, in 1901, is supposed to have attained a speed of 120 miles per hour for a distance of five miles. The Empire State Express of the New York Central is said to have run a mile at the rate of 112 miles per hour in 1893, and on the Philadelphia and Reading, in 1904, over 4½ miles is supposed to have been done at the rate of 115 miles per hour.

It is also generally recorded that an electric locomotive, in a test run in Germany, has attained the high speed of 130 miles per hour, and if this be true, it is undoubtedly the fastest run ever made by a locomotive.

The introduction of the electric locomotive has led to much speculation in regard to future train-speed. There is no question about the fact that greater power can be concentrated in an electric locomotive than in one operated by steam; but it does not follow that railroad companies will accelerate the speed of their trains because they have conveniently the power necessary to do so.

Within one decade after the locomotive first began hauling regular trains, the world was informed that the speed of one hundred miles an hour would be achieved by railway-trains in the near future.

When years elapsed and the 100-mile-an-hour velocity was not achieved, people interested put down a mile a minute, or 60 miles an hour, as the common speed of the coming railway operating.

However, even that pace never became common, though it was attained for short distances on particular trains.

Ever since the steam locomotive was developed to approach to present capacity it has been practicable to run light trains at speeds approximating the mile-a-minute pace, but that speed has been rarely indulged in.

It may be affirmed without fear of successful contradiction that all the luxury-trains run at speeds over fifty miles an hour have been sources of loss to the companies operating them, and the roads know that people will not pay for the expense in operating them.

About the beginning of the present century an agitation was carried on in Germany in favor of employing electric locomotives for maintaining high speed on what was known as the Berlin and Zossen Railway. The engines provided were very powerful, and met the requirements of hauling an express-train for three hours at a speed of 120 kilometers (74.5 miles) an hour.

The required performance was achieved day after day for a few weeks, but it destroyed the track so rapidly that the experiment had to be abandoned after a few weeks, and it will not likely be repeated unless some other new substance more durable than steel is discovered for railroad construction.

CRANK-PINS AND DRIVING-RODS.

D. S. B., Kenton, Washington.—The location of the center of the crank-pin is made at a certain distance from the center of the

axle. If the stroke of the piston is arranged for 28 inches, the center of the crank-pin would be fourteen inches from the center of the axle.

The work is usually done by a machine adapted to the exact distance, but where such machines are not in use, the distance may be readily marked with an adjustable tram. Where the wheels and axles are attached together, care must be taken that the crank-pins are set at right angles.

Machines are also in use for this purpose, but the setting of the cranks in their proper relation to each other may also be accomplished by skilled mechanics adjusting the position of the cranks by the use of proper tools. In regard to the fitting of the rods, the usual method is to fit the brasses in the rods before being bored out; that is, in the case where there are double brasses.

The straps with the attached brasses are then secured on the rods by bolts passing through the straps and rods. A piece of wood is then fitted in the brass and a small piece of sheet tin attached to the piece.

By the use of a tram adjusted to the exact length of the rod desired, the centers of the brasses at both ends of the rod may then be marked off, and the straps removed, and the brasses remaining in the straps are then bored to fit the crank-pin in a lathe.

An extra-careful fitting is necessary by the use of a file, at which the brasses are removed from the straps; and by the use of black paint a correct fit may be made, as the boring-out process is rarely as exact as might be wished.

The brasses are also tried when placed again in the straps, as not infrequently the straps have a slightly cramping effect on the brasses, especially at the points where the brasses adjoin.

In the case of solid brasses, they are bored out slightly larger than the crank-pin and pressed into place, and generally require no fitting.

In refitting double brasses, care must be taken to retain the exact length of the rod. This is done by the use of thin metal liners corresponding to the amount of material that may have been removed.

The proper adjustment of the rods should always be proved by tramming in order to ascertain if the rods retain their exact length.

CANADIAN NORTHERN OFFICERS.

F. G. L., Minneapolis, Minnesota.—The mechanical department officers of the Western Lines of the Canadian Northern Railway system and their locations are—A. H. Enger, assistant superintendent of rolling-stock; G. H. Hedge, general master mechanic, and H. A. English, master mechanic, all with headquarters at Winnipeg, Manitoba.

Other master mechanics on this line are J. Kyle, at Edmonton, Alberta, and C. J. Quantic, at Port Mann, British Columbia.

NEW HUDSON BAY RAILROAD.

J. L. D., Chicago, Illinois.—The names of the officers that will be in charge of the operating department of the New Hudson Bay Railroad have not yet been made public.

TOO SOON.

B. C. H., Little Rock, Arkansas.—At the time this answer is written, construction work on the newly organized Ozark and Arkansas Midland Railroad had not been started, and hence we are unable to tell you who the under officials are that will have charge of the work. If you will communicate with R. F. Henderson, secretary of the company, at Dallas, Texas, he will probably give you the information desired.

PENNSYLVANIA SYSTEM.

J. B. L., Chicago, Illinois.—We could not publish in this department the complete details you wish in regard to the Pennsylvania system. A large amount of the capital stock of the Norfolk and Western is owned by the Pennsylvania.

In regard to roads comprising the Pennsylvania system, see our answer to H. Y. P., Youngstown, Ohio, on page 123 of the January, 1917, issue of the RAILROAD MAN'S MAGAZINE. In the answer referred to we give the principal divisions of the system and the mileage of each.

STILL AFTER US.

A. W. H., Indianapolis, Indiana.—We want to thank you for your very kind interest in the "Light of the Lantern Department," and to assure you that no attempt was made to "put you on the green carpet" in our reply to an "Indianapolis Booster" that appeared in the March issue of the RAILWAY MAN'S MAGAZINE.

You are not taking up too much of our time by any means, for we really want all the criticisms that the readers of this department can heap upon us; but when we are right, we do not expect a reader to inject something that is not paramount or relative to the subject under discussion. At first you claimed we were wrong in our original answer. Now you admit we

were right, or nearly so, and now wish to open up an entire new phase of the subject.

We would point out to you that railroads, divisions of railroads, and railroad systems are entirely different things. A line may be controlled by a large system, but so long as such a road is operated by its own organization, our usual practise is to refer to such a line as a railroad. For instance, the Lake Erie and Western is a part of the New York Central system, but we would call it a railroad for the reason that it is operated by its own organization.

PITTSBURGH AND WESTERN.

H. B. H., Irish Ripple, Pennsylvania, writes: "When the old Pittsburgh and Western was built it was narrow gage, Allegheny to Canery, Zelienople and Duck Run, and finally as far west as Chewton. There are a number of people who worked on the line to substantiate this claim."

But there is another set who worked the road who claim that the road was a narrow-gage line as far west as Newcastle Junction before it was changed to standard gage.

The editor of this department has been asked to settle the controversy, and admits he is "up a tree," after a careful search for the information. Does any of our readers care to help him in this matter?

S. P. MASTER MECHANICS.

L. A. W., Monroe, Missouri.—Some of the the master mechanics on the Southern Pacific, and the points at which they are located, are as follows:

C. R. Burroughs, San Francisco, California.
D. Hickey, Ogden, Utah.
F. C. Keim, West Oakland, California.
W. F. Merry, Los Angeles, California.
W. C. Peterson, Tucson, Arizona.
L. S. Pratt, Roseville, California.
J. Shelaberger, Bakersfield, California.
W. T. Small, Dunsmuir, California.
A. D. Williams, Stockton, California.

OIL-BURNERS.

H. T. W., Haverhill, Massachusetts.—A fireman of experience on coal-burning locomotives would certainly be given preference over those without such experience where help is required for oil-burning engines. The oil-burners in the Eastern States may be said to be a negligible quantity.

There are a few of them in the State of New York operating through the heavily wooded sections of the Adirondack Mountains by order of the Public Service Commission, the object being the elimination or prevention of forest fires, which are sometimes attributed to locomotive sparks.

ALGOMA AND HUDSON BAY.

F. A. S., Bromptonville, Quebec, Canada.—We presume you refer to the Algoma Central and Hudson Bay Railway, on which road the trainmaster is A. Senior, at Sault Ste Marie, Ontario, Canada.

SHAY-GEARED LOCOMOTIVE.

W. G. W., Lyle, Minnesota.—The locomotive shown in the cover design of the RAILROAD MAN'S MAGAZINE for March, 1917, is an example of the type known as the Shay-geared locomotive. This design of locomotive is used generally in logging-service or where there are steep grades.

As you will note, the entire weight of the engine and tender is utilized for adhesion.

In front of the firebox on one side of the locomotive a three-cylinder vertical engine is located which drives a horizontal shaft made in sections which are flexibly connected. This shaft extends the entire length of the engine and tender, and drives all the axles by bevel gears located on the shaft and wheels; so that all the wheels of the engine and tender may be said to be drivers.

Sharp curves are easily negotiated by these engines, the wheels of which are coupled in four-wheel swiveling-trucks.

ENGINES UNDER TENDER.

D. E., Golden, Colorado, writes: "On page 474 of the March number you mention the locomotives built at an early date with an engine under the tender, saying that they were discarded on account of the difficulty in getting steam back to these engines.

"Now, in the account I saw of them it said that the reason was that they could pull a longer and heavier train than could be controlled with the braking facilities they had in those days, and that the sidings were not long enough to accommodate them.

"So you see it was another case of invention being made before it was time for it to be utilized, as the air-brake had not been invented."

A very peculiar theory indeed. If the author of the account to which you refer was correct, and that the length of sidings and limitations of braking facilities were all that prevented the

adaptation of this design of locomotive in the early sixties of the last century, we would ask why such design was not adhered to in the subsequent development of railway power

As a matter of fact, on the Great Northern Railway of England, in 1863, locomotives with tender's drivers were in use. As you say, the tractive effort was materially increased, due, of course, to the weight of the tender being used for adhesion, but instead of compounding, high-pressure steam was taken direct from the locomotive boiler, with the result that the operating and maintenance costs were so great that the cylinders and driving-gear were removed from the tenders, and the locomotives changed to operate in the usual way

Further, consider this objection to the theory that their abandonment was due only to the failure to provide braking-power. In those days in England as trains lengthened, additional brake-guard vans were provided, and it does not seem reasonable that the practise could not be extended in the case of the trains behind such locomotives, if the engines operated economically

NEW YORK TO CHICAGO.

A. H. T., Seward, Alaska.—The answer to your question has been repeatedly given in this department. The fastest scheduled train between New York and Chicago are the Broadway Limited of the Pennsylvania, and the Twentieth Century Limited of the New York Central. Both trains are scheduled twenty hours for the run between the two cities

PULLMAN SUPERINTENDENT.

A. C., Savannah, Georgia.—The superintendent of the Pullman Company in your district is W. M. Camp, with headquarters at Atlanta, Georgia, who will probably furnish the particulars you wish

LOCOMOTIVE CHARTS.

T. P. K., New York, and other readers.—Educational charts of locomotives and cars may be obtained from the Railroad Book Supply Company, 3 Jackson Street, New Rochelle, New York. These charts are scale drawings in sectional, or, rather, fantom view, showing all the parts of the locomotive and cars. The parts are all numbered and the names given

The locomotives include the American, Atlantic, Consolidation, and Mikado types, and box, gondola, passenger, and sleeping-cars

The price per copy is twenty-five cents, or a set of any five for one dollar These charts will prove an excellent help to people studying locomotive or car-practise

STATIONS AND YARDS.

G. T. S., Madoc, Montana.—The Standard Code does not attempt to give in detail the manner in which protection is to be given in yard-limits, for the reason that the conditions and practises vary with the different roads, and the exact manner of securing protection is left for each road to determine for itself Unless you furnished us some details in regard to the usual practise on the line you have in mind, we would not care to venture an opinion on a subject of this kind

Briefly, a yard is a system of tracks, and always of defined or specified limits, in which trains are made up, cars are stored, and other similar purposes are effected

Over such tracks movements not authorized by time-table or train orders may be made, subject to the regulations and prescribed signals

The limits of a yard are usually designated by boards placed alongside the track

The term station is applied to a place designated on the time-table by name, at which trains stop for traffic; or a place from which trains may enter or leave the main track, or from which fixed signals are operated

U. S. SAFETY STANDARDS.

H. A. W., Stanford University, California. Full details in regard to the requirements and standards for locomotives and cars under the United States Safety Appliance Acts are given in a book published by Gibson, Pribble & Co., Richmond, Virginia. The book is put out in several bindings. In board covers it sells at fifty cents per copy

THE LINK AND PIN.

I. H. B., Medford, Oregon, and other readers have commented on the illustration of the link-and-pin coupling that appeared on page 381 of the March issue of the RAILROAD MAN'S MAGAZINE in the article entitled "Romance of the Coupler." We agree with them that the position of the trainman engaged in making the coupling was a particularly hazardous one and if our staff artist that prepared the illustration had been familiar with the extremely delicate operation of car-coupling in the link-and-pin days he would know that no man would dare take hold of the link in any other way than with the first finger and thumb.

Likewise our artist should also have known that it is physically impossible for the ordinary

man to have one hand on the side of a car and the other hand grasping the link. A man attempting to make a coupling in this way would likely lose a hand; and if he stood in the position in which the figure is shown in the illustration, and on which our readers have also commented, he would in all probability be crushed to death as the cars came together.

In the old days the trainman had to crouch below the bumpers and slip the link and pin at the precise moment.

PAY OF TRAINMEN.

L. D. J, Meadville, Pennsylvania.—We would publish your letter except for the fact that you are wrong in your criticism of our answer in regard to the pay of trainmen that appeared in the December, 1916, issue of the RAILROAD MAN'S MAGAZINE. Of course, you know the rate you are being paid at the present time, but that has nothing to do with the question asked or the answer given.

The matter of schedules or scales, or whether trainmen were engaged in freight or passenger service was not dealt with in our answer

We said the average daily compensation of trainmen in the United States—not in the district in which you are operating—was $3.04 per day. This figure for the entire country is correct, or it ought to be, for it is furnished by the Interstate Commerce Commission.

CAR BOOKS.

A. A., Livingston, Montana.—There is no book published on the subject of car-construction and repair. The annual proceedings of the Master Car-Builders' Association contains, sometimes, papers on certain phases of this subject; but there is no general book that we know of.

"The Car-Builders' Dictionary," published by the McGraw-Hill Book Company, New York City, gives detail drawings of all kinds of cars and car appliances, but this is all that we can recommend to you.

EMBRYO RAILROAD MEN.

C. E., Fayetteville, North Carolina.—A list of publications or magazines that circulate among those ambitious to enter the railway service is one thing that we cannot furnish, and if such papers exist, we do not know of them

The various publications issued by the brotherhoods and orders of railroad men, as well as the magazines published by the railroads themselves, are all circulated among members or employees who are already in, or familiar with, railway service.

We wish we could be of service to you, but can only recommend the popular magazines for this matter.

ERIE'S BIG ONES.

H. L. R, East Toledo, Ohio.—We are just as fully aware of the developments in locomotive practise as are any of the more technical publications, but you, as well as some of our other readers, overlook the fact that the articles appearing in the RAILROAD MAN'S MAGAZINE are written sometimes months in advance of the publication date. No attempt is made to handle news or strictly current events in our pages.

Another thing, the theoretical tractive-power of a locomotive and its actual power in the service for which it was designed are entirely different things. As we stated previously, we know that the Virginian Triplex exceeds the Erie engine of the same type in rated tractive-power, but our article on which you have commented was written and in process of printing before the Virginian engine was delivered or the articles in the technical press, to which you refer, were even thought of.

A description of the new leviathan appears on another page of this issue.

PENNSYLVANIA R. R. EMPLOYMENT.

UNDER a new plan for handling applications for work, which is now being put into effect by the Pennsylvania Railroad, every one of the 1,500 station-agents on the lines east of Pittsburgh and Erie will become an employment agent.

In connection with the change, what will be virtually an employment clearing-house is to be established in the general manager's department at Broad Street Station, Philadelphia

It is the belief of the management that a number of men in the country districts, as well as in the towns, villages, and cities through which its lines pass, would welcome the chance to make railroading their career, but in many cases do not know where to apply. The new employment arrangements will make it easy for anyone to make an application and to ascertain what lines of service are open and in what localities work for which he is fitted may be obtained.

Notices will be posted conspicuously at various points along the railroad, directing all persons seeking employment to apply to the station-agent. The agent will interview each applicant, learn his capabilities as fully as possible, and direct him to the nearest official who may have vacancies at his disposal.

If there are no vacancies on the division where the application is made, it will be for-

warded to the offices of the general manager at Broad Street Station, where it will be handled through the clearing-house plan which is to be established there.

Under this arrangement each applicant can be promptly directed to the nearest point where labor is needed, in case no opportunity exists near his home

JACOB GRETSINGER.

L. T., New London, Connecticut.—We do not believe that Jacob Gretsinger, after his retirement as president of the Brooklyn Rapid Transit Company in 1903, was connected with any other road; at least, we know of no such connection

As to his personal history, he was born July 1, 1840, at Elmira, New York, educated at Elmira Academy; entered railway service in 1860, since which time the salient dates in his career are—1870, fireman Erie Railway; 1870 to 1886, successively on construction, machinist, engineer, trainmaster, roadmaster, station-agent, assistant general freight and passenger agent, and general superintendent of Utica, Ithaca and Elmira Railroad; Ithaca, Auburn and Western Railroad, Cazenovia, Canastota and DeRuyter Railway, and the Canal Railway Company; December, 1886, to June, 1888, superintendent of equipment, Chicago and Indiana Coal Railroad and assistant master mechanic, Chicago and Eastern Illinois Railroad; June, 1888, to February, 1890, master mechanic, Duluth and Iron Range Railroad; February, 1890, to March, 1892, general superintendent, same road; March, 1892, to March 20, 1901, general manager, and June, 1892, to March 20, 1901, also president, same road; March 20, 1901, to February 2, 1903, president, Brooklyn Rapid Transit Company

ALASKA RAILROAD.

J. M. N., Hannaford, North Dakota.—If you will communicate with W. C. Edes, chief engineer of the Alaskan Engineering Commission, Seward, Alaska, he will likely furnish the particulars you wish

LOCOMOTIVE CLASSIFICATION.

J. F. M., Cleveland, Ohio.—The editor of "The Light of the Lantern" has forwarded you a sheet, giving the Whyte system of locomotive classification as used by the American Locomotive Company

We do not have a spare copy of the Baldwin system of classification, but if you will communicate with the Baldwin Locomotive Works, Philadelphia, Pennsylvania, they will likely furnish you a copy.

We will again publish both systems of classification in this department in an early issue of the RAILROAD MAN'S MAGAZINE

BRAKEMEN.

M. H., Flat River, Missouri, writes: "Can a fellow brake, if he is under age, if his father will allow him to? A school tells me a man between the ages of 18 to 35 can take a position on the railroad."

Certainly, if he can get the opportunity Much depends on the physical appearance of the applicant. As a rule, no railroad will engage a minor for such jobs without the consent of the applicant's parents or guardians.

AMARILLO, TEXAS, LINES.

L. R. S., Canton, Ohio.—The following roads enter Amarillo, Texas—Chicago, Rock Island and Gulf; Fort Worth and Denver City; Panhandle and Santa Fe lines

S. P. APPRENTICE SCHOOLS.

J. W. M., Eagle, Idaho.—Schools for the instruction of apprentices on the Southern Pacific system are located at all of the principal shops throughout the system

ONCE AGAIN.

J. L., Effingham, Illinois.—Our answer to M H., Flat River, Missouri, in this issue, gives the information you wish

CANADIAN LINES.

T. F., Oil City, Pennsylvania.—At this writing no new construction is reported for the Grand Trunk Pacific or the Canadian Northern In regard to the officials of these lines, the general superintendent of the first-mentioned road is H. H. Brewer, at Winnipeg, Manitoba, and of the latter road, A. Wilcox, also at Winnipeg, Manitoba.

FROG NUMBERS.

L. C. A., Columbus, Ohio.—A number on a frog indicates the spread of the angle included by the tongue-rails, the spread in a No. 8 frog being one inch in eight inches. The number may be determined in various ways:

Measure the distance between points where the width over gage-lines is two inches and three inches; this distance, in inches, will give the frog number

Another method is to divide the length of the gage-line, from heel to true point, by the width over the gage lines at the heel; or take the sum of the width over the rail-heads at the heel and between at the toe, and divide this into the length on the gage-lines from toe to heel

The frog number is equal to the reciprocal of twice the size of the frog-angle. The frog-angle is that included by the tongue rails.

AMPERSAND OR AND.

2. Some roads use the sign ampersand (&) in their titles, while others use the word "and." We adhere generally to the use of the word and, unless the name of the road is given by initials only; and while it sometimes is a slight variance from the actual title of the road, it is purely a matter of office style with us.

CONTINUOUS CROSSINGS.

3 We have heard of so many things of this kind that we do not know exactly which one you refer to. If you will give its trade name, or tell us something that will assist in identifying the device you have in mind, we will endeavor to tell you something about it.

JULIAN BEGGS CONTROL.

4. The Julian Beggs Automatic Stop and Train Control to which you refer is being developed and tried in experimental service on the Queen and Crescent Route. In this system the automatic speed-control is effected by a speed-recorder which is connected to an axle on the locomotive, and to which is attached a series of contact segments arranged for any predetermined speeds

A three-position cab-signal instrument controls the cab-signals and the connections to the various segments in the speed-recorder

The other essential parts of the engine equipment include a train brake-valve, cab-signal with red, yellow, and green lights, air cut-out, and a twelve-volt battery. The instruments are connected with insulated wires, protected by standard iron conduit.

A three-position instrument consists of an armature mounted on the same shaft with a rotating three-position circuit controller, a constantly energized field-coil acting on the armature, and an electro-magnetic lock for holding the armature and circuit controller in the respective positions, counterweights being arranged automatically to restore these parts to the neutral position when left free to rotate.

An engine contact-shoe is attached to the engine buffer-beam in position to engage the ramp-rails located beside the track.

We could not publish in this department complete details of the workings of this system of train-control. It may be stated briefly however, that the train brake-valve of the engine equipment is connected to the equalizer-tank of the air-brake system, and this valve is connected by a piston in the contact-shoe.

The ramp rails are connected with track-batteries through a three-position circuit controller so as to be supplied with positive energy when the block which they repeat is clear; with negative energy when the block is at caution, and with no energy when the block is at danger.

The instrument is so arranged that when rotated in a clockwise direction it is in a position to supply energy to the clear signal, and also to the train brake-valve through a controller on the speed indicator. When rotated to the counter-clockwise position the circuit through the train brake-valve is closed through contact in the speed recorder, and the caution light is displayed

In the neutral position the circuit is closed through a contact in the speed recorder, and the danger signal is given. A contact in the speed recorder fixes the maximum rate at which a train can operate under a clear signal, another the caution rate, and a third the allowable speed after a stop has been made for a danger signal

These rates can be predetermined for the conditions existing on any given road, and after receiving any one of these indications, if the speed of the train exceeds that fixed by the recorder, the circuit is automatically broken by the recorder, and the train brake-valve opens, causing a reduction and an application of the brakes until the speed has been reduced within the specified limit.

FOSTER, LIBBY & CO.

A. H. M., Fort Worth, Texas.—We are unable to find any record of the present location of Foster, Libby & Co., who were formerly located in the Monadnock Block, Chicago, Illinois. This concern was engaged in the train-auditor correspondence business, and it is just possible that some of our readers may furnish us their present address, if they are still engaged in this work.

INTERSTATE COMMERCE INSPECTOR.

E. N. S., North Liberty, Indiana.—If you will communicate with Mr. Frank McManamy, chief inspector of locomotive boilers, Interstate Commerce Commission, Washington, District of Columbia, he will furnish you the complete details you wish.

Telegraphic & Telephonic

IF there is anything you want to know about the telegraph, telephone, or radio telegraphy—if you have an operating problem that puzzles you—if you want to discuss a question of theory—write the RAILROAD MAN'S MAGAZINE. We have engaged a technical expert who is one of the leading authorities of the country on these subjects. Ask him. He knows!

SOUTH AMERICAN CABLES.

E. A. S., Indianapolis, Indiana.—The general offices of the Central and South American Telegraph Company are located at No. 64 Broad Street, New York City. The Mexican Telegraph Company may be reached at this same address.

The United Fruit Company, which operates its own radio-telegraph system may be reached by addressing Mr. George S. Davis, General Superintendent, 17 Battery Place, New York City.

At the present time the West India and Panama Telegraph Company is in need of cable operators who can receive from the mirror instrument; address Mr. A. Perkins, Manager, Tetuan Street, San Juan, Porto Rico.

WIRING BLUE-PRINTS.

N. S., Windsor, Ontario.—Blue-prints, showing the wiring of repeater and Morse multiplex circuits are issued from the engineering offices of the various telegraph companies, and from the office of the superintendent of telegraph on railroads.

Any good book on telegraphy contains diagrams of all regular and special circuit wiring, from which you can easily make larger drawings of your own.

OPEN-CIRCUIT WIGWAG.

C. O., Packton, Louisiana.—It is presumed that your inquiry is based upon the suggestion in Mr. Beach's article in the March RAILROAD MAN'S MAGAZINE, to the effect that there is need for an *open circuit* vibroplex transmitter.

The manufacturers of vibroplex and other types of semiautomatic telegraph transmitters in this country have sold a number of these machines to foreign telegraph administrations operating open-circuit systems.

In order to use a vibroplex transmitter in the operation of an open-circuit line it has been necessary to employ the transmitter to operate locally an ordinary pole-changer type of relay; that is, a relay with its back-stop and front-stop contacts electrically separated. The armature of the relay is then connected with the line wire, the front stop with the main line battery, and the back stop with the ground connection.

I understand the Martin Vibroplex Company own patents on an open-circuit vibroplex, equipped with back-stop contact, but which they have not placed upon the market, possibly owing to the fact that it is well established that at speeds rapid enough to be commercial, an operator cannot satisfactorily operate any type of key or transmitter which requires a solid working contact to be made by depressing the key, and also by opening the key.

As you know, in duplex working, the key or vibroplex is used to operate a transmitter. It is evident that if the operator could make equally satisfactory "marking" and "spacing" contacts with the key, the transmitter (or the pole-changer) could be dispensed with.

It is true that in England a type of key is employed in duplex working which does the work of the American pole-changer; but where it is employed the speed of transmission is considerably less than that maintained on American lines. Also it is true that in cable operation a two-lever key is employed, but the circuit conditions are somewhat different from those of land-line circuits.

INSTRUCTION IN TELEGRAPHY.

"XN," Lansing, Michigan.—Your determination to make headway by studying the technical side of the business shows the right spirit. If you persevere in your studies, your chances are excellent for advancing to a desirable position as soon as you are qualified

The latest complete work on the subject of Telegraphy is "American Telegraph Practise," published by the McGraw-Hill Book Company, 239 West Thirty-Ninth Street, New York City. The price is four dollars. This book contains

complete instructions for the wiring and operation of repeaters, duplexes, quadruplexes, dynamos, switchboards, *et cetera*.

C. P. R. TELEGRAPHERS.

R. G., Waterbury, Connecticut.—The minimum salary paid telegraphers on the Canadian Pacific Railway west of Fort William, Ontario, is $78 per month; agents, $83 per month. The maximum salary for telegraphers, which is on the British Columbia Division, is $100 per month

The eye-test requirements are: "20/30 combined, not less than 20/40 in either eye—with or without glasses."

YETMAN TRANSMITTER.

G. H. C., Chicago, Illinois.—The Yetman transmitter as manufactured fifteen years ago is no longer on the market; but a machine with the same type of keyboard and a similar transmission system (without the type printing feature) is now manufactured by the International Transmitter Company, 84 Johnson Street, Brooklyn, New York. The machine can be assembled to send either Morse or Continental signals.

HAND-KEY ADJUSTMENT.

C. R. W., Jersey Shore, Pennsylvania.—The adjustment of the compression spring of a Morse key should be regulated to suit the requirements of the individual operator. Some operators prefer a "light" and some a "stiff" tension of the spring. Each man should adjust the spring of the key he works regularly, so that the signals sent out will be *solid*, but not *sticky* A stiff spring adjustment tires the arm sooner than a light adjustment. A good rule to follow is to maintain an adjustment which will allow you to send your very best Morse at a good rate of speed for an hour or more without tiring.

MEANING OF "OS."

LOU McC., Salt Lake City, Utah.—In the May issue of the RAILROAD MAN'S MAGAZINE you will find an explanation of the meaning of the symbol OS.

RADIO EMPLOYMENT.

F. C. B., Chicago, Illinois.—If you are qualified to take a position as radio operator, the Marconi Company could undoubtedly find a place for you without much delay. If you have not as yet studied the system and learned how to operate radio apparatus, it will probably take several months for you to qualify

The conditions of radio employment are changing—and improving—so that we would recommend that you wait until you have learned the game before deciding where to seek employment A good book for a beginner is "Experimental Wireless Stations," by P. E Edelman. Copies may be obtained for $1 50 each from P. H. Pauli, 415 Tribune Building, Minneapolis, Minnesota.

RAILROAD CODE.

T. D., Washington, District of Columbia.—The Morse Code is used on all American railroads as well as on railroads in the Dominion of Canada.

THE VIBROPLEX.

C. R. W., Jersey Shore, Pennsylvania.—Although the Vibroplex Company strongly recommend their new single-contact instrument as the best to be had, a great many operators prefer the older style double-contact instrument. So far as the carrying qualities of the signals are concerned, one type seems to be as good as the other when in the hands of operators who use good judgment in regulating the speed of the dots, and who try at all times closely to imitate good hand-sending

To regulate the speed of the transmitter so that it will carry properly over long circuits and through automatic repeaters, adjust the lever-weight so that eighteen "P's" may be clearly sent in a period of ten seconds.

RADIO INFORMATION.

R. W., Mattoon, Illinois.—Thanks for your fine letter. We have several times announced that we would be glad to present any desired information about radio telegraphy for the instruction of railroad operators, but so far the demand has not been extensive. In the meantime we are answering all radio queries that come in, and hope that the interest in radio will increase

POSITIONS IN THE WEST.

G. VAN O., Valparaiso, Indiana.—You might apply to Mr M. H Clapp, superintendent of telegraph, Northern Pacific Railroad, St Paul, Minnesota, C. A. Worst, assistant superintendent telegraph, C., B. & Q. Ry. Co., Chicago, Illinois; P. W Drew, superintendent telegraph, Soo Line, Chicago, Illinois; and E. A. Patterson,

superintendent telegraph, C., M. & St. P. Ry. Co., Milwaukee, Wisconsin.

We understand that at this time of year the Oil Line companies, other than those in Pennsylvania, do not require any additional operators.

TELEGRAPH STUDENT.

C. R. C., Haverhill, Massachusetts.—There is a telegraph school known as the Eastern Telegraph Institute, located at 899B Boyleston Street, Boston, Massachusetts.

There is now a lively demand for lady telegraphers to work the lighter wires in large offices and for positions in the smaller towns. You might be able to secure an opportunity to learn the business in your own town.

Write to Superintendent, Western Union Telegraph Company, Boston, Massachusetts, asking that gentleman if he can arrange with the company's manager in Haverhill to allow you to practise in that office. If for any reason this cannot be brought about at this time, write to the superintendent, Postal Telegraph Company, Boston, Massachusetts, asking him the same question.

TELEGRAPH PROBLEMS.

C. O., Packton, Louisiana.—Answering your questions in the order submitted:

1. When conductor-wires in cables are insulated with rubber there is considerably less likelihood of individual conductors becoming crossed within the cable, and greater terminal voltages may be applied to the conductors than when paper is used as the insulation. The use of paper-insulated cables is becoming quite extensive in telephone work, where only low voltages are used.

In telegraph work office-cables consisting of enameled, silk, or cotton-covered conductors have been used extensively; but quite recently it has been found that where quadruplexed conductors pass through these cables, breakdown is frequent, especially at cable-heads. This has resulted in reverting to the use of rubber-covered cables for inside conductors carrying quad voltages.

For short lengths of cable, the higher electrostatic capacity of rubber-covered conductors is not serious. Outdoor, or aerial, cables of long lengths generally are of paper insulation, the entire cable being enclosed in a thick lead sheath.

2. With ordinary telegraph voltages, telegraph circuits operated at high-speed work as satisfactorily when composed of 500 miles of number nine copper strung on poles as through ten miles of rubber-covered cable.

3. During wet weather when there is a considerable amount of transverse leakage between wires at cross-arms, raising the terminal voltage of the individual circuits improves the working of the circuits; but where difficulties of this nature exist, the proper remedy is not to raise the voltage, but to increase the insulation resistance of the individual conductors at the points of support. Replacing cracked and broken insulators generally has the right effect.

4. The use of the fantoplex system of telegraphy is objectionable only where there are telephone circuits carried on the same pole-line as the fantoplexed wires. The fantoplex is not extensively employed, probably not more than a dozen circuits being in operation in this country. Undoubtedly there are many places where the system could be applied with satisfactory and economical results.

The voltages used may be 110 or 130, alternating current at from 60 to 130 cycles. About 300 miles is the maximum length of circuit over which satisfactory service has been maintained.

5. The single-dynamo quadruplex is used chiefly at stations where but one quad set is operated. A quadruplex circuit may have a two-dynamo source of current at one end and a single-dynamo source of current at the other end.

A large office with ten or twenty quad sets may have all of these sets operated by one pair of motor-generators. There are many difficulties in the way of operating more than one quad set from a single-dynamo source of current.

6. As you point out, it is customary to employ the increment of current in a quadruplex system to close the neutral-side relay, and the decrement of current to cause the relay to open. The strength of the current required to close the second-side relay, and the value of the current when the armature of this relay releases is determined by the ratio of the long-end and short-end voltages employed.

This may be three to one or four to one, as the case may be.

In the case of a three-to-one ratio the increment may have a value of 75 milliamperes, and the decrement a value of twenty-five milliamperes. Theoretically it is better to use the increased voltage to "make" the signal and the reduced voltage to make the "space" element of the letters.

7. The short-line duplex with battery at one end only is a more satisfactory arrangement than the earlier city-line duplex. The former employs standard polar relays, while the latter requires in operation at the non-battery end of the line a special differentially wound relay with a higher resistance in one coil than in the other.

8. Yes, the ordinary bridge duplex will work if a 5U coil is inserted at the split in place of the 3,000 ohm non inductive coils formerly con-

nected there. For high-speed Wheatstone operation it is likely that the non-inductive resistance would be preferable.

The polar relay in the Western Union quad could not be replaced by a common relay with satisfactory results, as this relay must respond to current reversals at the distant station.

9. As suggested in (5), it is not practicable to use the single-dynamo plan in operating a number of quadruplex sets. The voltage would fluctuate widely, due to the simultaneous operation of several pole-changers.

10. The Jones quadruplex system is regarded by some engineers as superior to any other system in use, especially on lines affected by inductive disturbances, and on lines where high insulation standards are not maintained.

11. The Hickley rectifier, designed to change alternating current to direct current, is no longer manufactured. The Mohawk Electric Company of Newark, New Jersey, now manufacture rectifiers similar in design and operation to those made by the Hickley Company.

12. A sixteen candle-power carbon lamp requires a current of about one-half ampere. To light ten of these lamps would require five amperes. Twenty 25-watt tungsten lamps require about the same current as ten 16-c.p. carbon lamps at 110 volts pressure.

In charging storage-cells it is well to employ an ammeter to determine the value of the charging current. Charging mains must not be directly connected to a bank of storage-cells. Were this done the mains would be short-circuited. Lamps are employed to furnish the required series resistance.

13. In order to obtain an e.m.f. of 385 volts by connecting together a 200-volt and a 185-volt generator, all that is necessary is to connect the brush terminals of one machine with the brush terminals of the other, making sure to connect the positive brush of one to the negative brush of the other. Across the field-winding of the 185-volt machine the difference of potential would be 385 volts.

14. The cores of telegraph instruments generally are made of solid iron rod, thoroughly annealed (softened). This form of construction is cheaper, and generally more satisfactory, than using a bundle of small iron wires to form the core.

For ordinary telegraph speeds solid-iron cores are "fast" enough for the purpose aimed at. Theoretically, cores made of small iron wires are "faster"; that is, they magnetize and demagnetize more rapidly than solid cores. This principle is taken advantage of in the design of the Western Union neutral relay.

Permanent magnets are used only as you state. In practise, a solenoid is regarded as a coil of wire wound upon a spool with a hollow core, or with a core of non-magnetic material.

It is now regarded as ancient practise to regard the "resistance" of a telegraph instrument as having accurate bearing upon the instrument's efficiency. For circuit-resistance purposes it is well to know the ohmic resistance of the various instruments inserted in the circuit, but so far as the instrument's efficiency is concerned, it is of greater importance to know the ampere-turns of its winding.

Relative to the changes you suggest for the 340-mile circuit, while there are many factors involved, we believe that with properly designed relays a saving in battery could be effected.

RADIO RELAYS.

H. E. B., Dunmore, Pennsylvania.—A movement of one sixty-fourth inch of a diaphragm is hardly sufficient to permit of reliable operation of a tape recorder, due to the fact that it requires a current of about one-fourth ampere to operate the recorder, and with a current of that strength the contact-sparking difficulties are serious.

Recently two radio relays have been invented, one a gas-stream operated vane device which is somewhat intricate in construction and of delicate adjustment. It consists of a small metal cylinder, into one side of which is fitted the radio phone-receiver with the diaphragm inside the cylinder.

At the top of the cylinder there is a delicately pivoted vane equipped with an arm which controls a local circuit, including a register or sounder. Normally, a stream of gas supplied through the bottom of the cylinder impinges upon the vane, thereby holding the vane in the non-operating position.

When signals are received, actuating the phone diaphragm, the gas-stream is agitated and deflected from directly vertical travel, permitting the retractile spring attached to the vane-arm to close the local circuit. The gas-stream resumes its normal direction between the elements of each letter while the phone diaphragm is motionless.

The other relay referred to is described on page 1115 of the *Electric World* of May 13, 1916.

POLE MARKINGS.

INQUIRER. After gathering the information necessary to give you a satisfactory reply to your inquiry, we were unable to find your letter.

Along the line of the New York Central Railroad every fifth pole is marked. For instance, the first marking beyond Mile-Post 211 is marked 211-5, the second 211-10, *et cetera*, so that any given marking indicates the last mile-

post and the number of the pole from that mile-post. If there were 43 poles to the mile, the last marking would be 211-40, leaving three poles before the 212 mile-post.

The boards attached to occasional poles are placed by the maintenance-of-way department to indicate track-curves. The first figure is the number of the last mile-post; the letter indicates the first, second, or third curve in that mile.

The next figure indicates the degree of curvature, and where there is another number it gives the minutes of curvature. In general, unless the fraction is large, only the degrees are shown.

These boards are supposed to be placed at the commencement and the end of every curve, but in many cases are located only at the commencement of the curve. They are for the information of the sectionmen in handling their work and for a track record for engineering officers riding over the road.

TELEGRAPH ENGINEERING.

J. J., Youngstown, Ohio.—Thanks for those fine words in the first paragraph of your letter.

Answering your questions in the order submitted:

1. Using the Brown & Sharp (B. & S., or the American Wire Gage (A. W. G.) No. 9 copper has a resistance of 4.22 ohms per mile at a temperature of sixty degrees Fahrenheit. No. 8 iron has a resistance of 12.43 ohms per mile in the Birmingham Wire Gage at sixty degrees Fahrenheit; and 20.41 ohms per mile American Wire Gage.

2. During dry weather and when line-wires are thoroughly insulated, opening the key at the distant terminal station should show the wire to have a resistance reading in megohms (millions of ohms). During wet weather a line may be found to have a resistance of only four or five thousand ohms, even when the key at some station along the line is opened.

This is due to the fact that moisture at pole-supports (about forty of them per mile) creates a path to earth between line-wire and ground. Weather conditions as well as the general state of insulation of a line must always be considered when the per-mile resistance of a wire is being used as a factor in calculation.

3. Communicate with Mr. C. C. Oliver, Navy Department, Telegraph-Office, Washington, District of Columbia.

4. Communicate with the chief operator of the Associated Press at Chicago and at New York City.

5. Write to the McGraw-Hill Book Company, 239 West Thirty-Ninth Street, New York City, asking them to send you their catalogue of books on arithmetic and mathematics.

CIVIL-SERVICE TELEGRAPHERS.

J. G. L., Naco, Arizona.—Replying to your interesting letter, and answering your queries in the order submitted:

1, 2.—Civil-service telegraphers are employed mainly in the government departments at Washington—Agricultural Department offices and in the various Navy Department headquarters offices. Operators so employed perform the ordinary duties of sending and receiving telegrams.

3. The government's technical experts are not known as telegraph engineers, although having the same qualifications and rating. It is not necessary to be a college graduate in order to obtain these positions. Ordinarily such places are filled by promotion.

4. Salaries upon entering the service are about nine hundred dollars a year. A day's work is seven and a half hours, excepting Sundays, legal holidays, and Saturday half-holidays during the summer months.

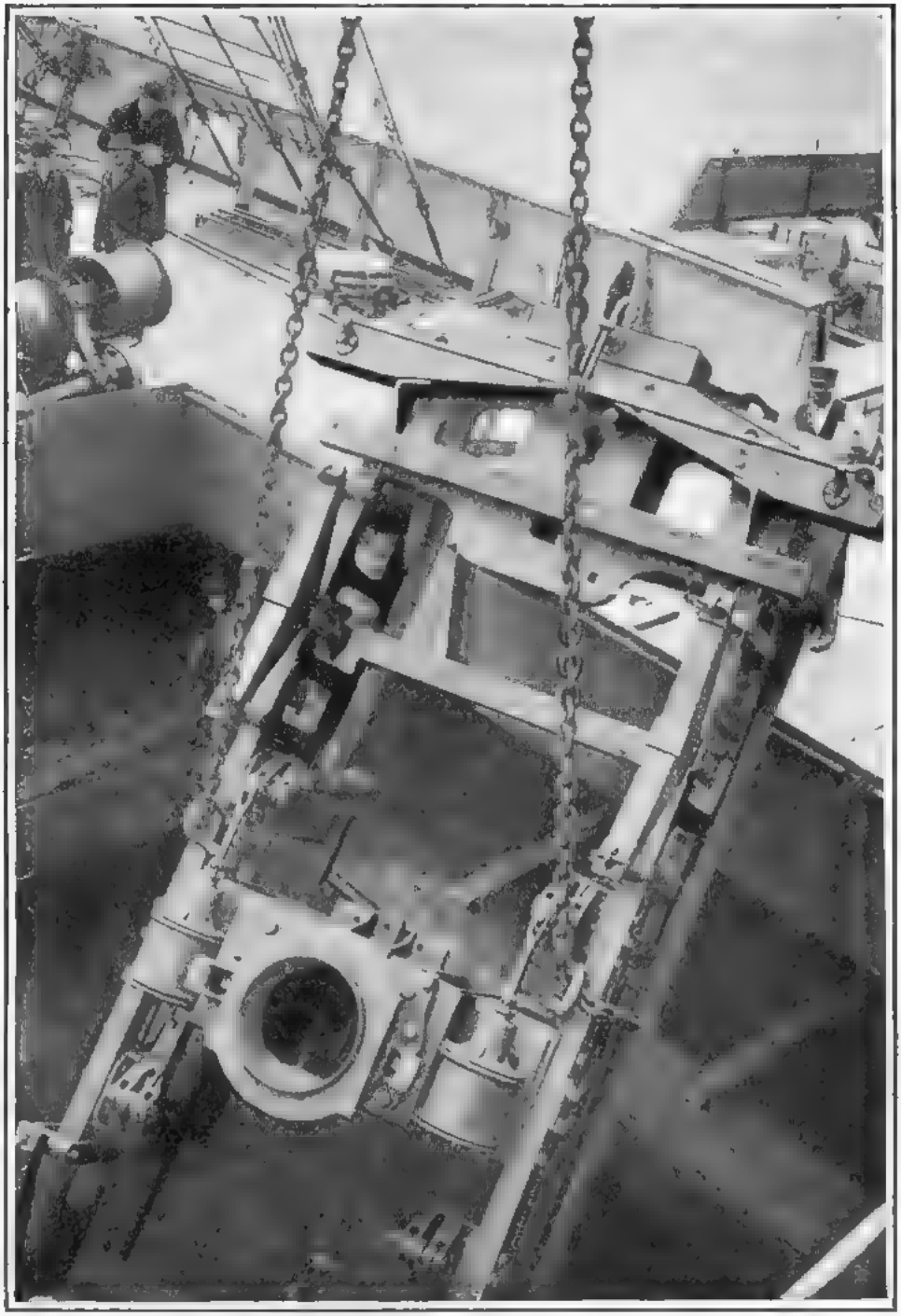
There is an allowance of thirty days' vacation a year, together with a thirty-day sickness allowance.

The 1917 spring examinations have already been held. You might once more write to the Civil Service Commission at Washington, asking to be notified when the next examination is to be held.

THE BIG SHIPPER SAYS:

Czars abdicate, but the only way to get rid of a traffic manager is to promote him.

From the Railroad Man's Magazine.



NO MATTER HOW THOROUGHLY A LOCOMOTIVE MAY BE KNOCKED DOWN FOR EXPORT, THERE WILL STILL BE SOME PIECES WHICH IT IS INEXPEDIENT TO RESOLVE COMPLETELY INTO THEIR CONSTITUENT BOLTS, SCREWS, CASTINGS AND WHAT-NOT. FOR EXAMPLE, HERE IS A TRUCK-FRAME BEING TRANSFERRED BODILY INTO THE HOLD OF A FREIGHTER. THE FRAME WEIGHS 12 TONS AND MEASURES MORE THAN 24 FEET IN LENGTH

CRATING A LOCOMOTIVE.

They're Taken Apart, Numbered, and Boxed in Knock-Down Form for Export to Points as Far Off as Chile.

BY J. W. GREENBERG.

AMERICANS all know about the many things they can buy in handy knock-down form — houses, portable garages, folding-beds, tables, and what-not. But it will come as a surprise to those not familiar with all the details of railroad work to learn that a huge electric locomotive, weighing more than a hundred tons, on occasion is taken apart completely, and all its thousands of parts packed into neat cases which are stretched out along eight freight cars and exported from New York to the iron mines of Chile.

Heavy Stuff Goes as Deck Cargo, Also.

A common method of exporting heavy machinery of this type is to set it up in the shop where it is made, and then to ship it as it stands on the decks of ocean-liners. In this way it can be put into use as soon as the steamer has reached its port. Electric locomotives weighing forty tons and more have been hoisted on to ships in just this manner.

But not long ago the General Electric Company, of Schenectady, New York, found itself confronted with a new sort of problem when it received from an iron-mine company in Tofo, Chile, an order for three 120-ton electric locomotives. It was seen at once that the old method of export could not be employed.

The tools on hand were not big enough for the job. The dock and ship cranes would be unable to lift this enormous load on to the ships at New York, or off them at the South American port. Another scheme had to be thought up.

The big steel monsters, with their thousands of part, were undressed completely. Every bit of their apparel, from the enormous roofs, which weighed 46,000 pounds each, to the little six-ounce nuts, was laid out, carefully ticketed, and classified.

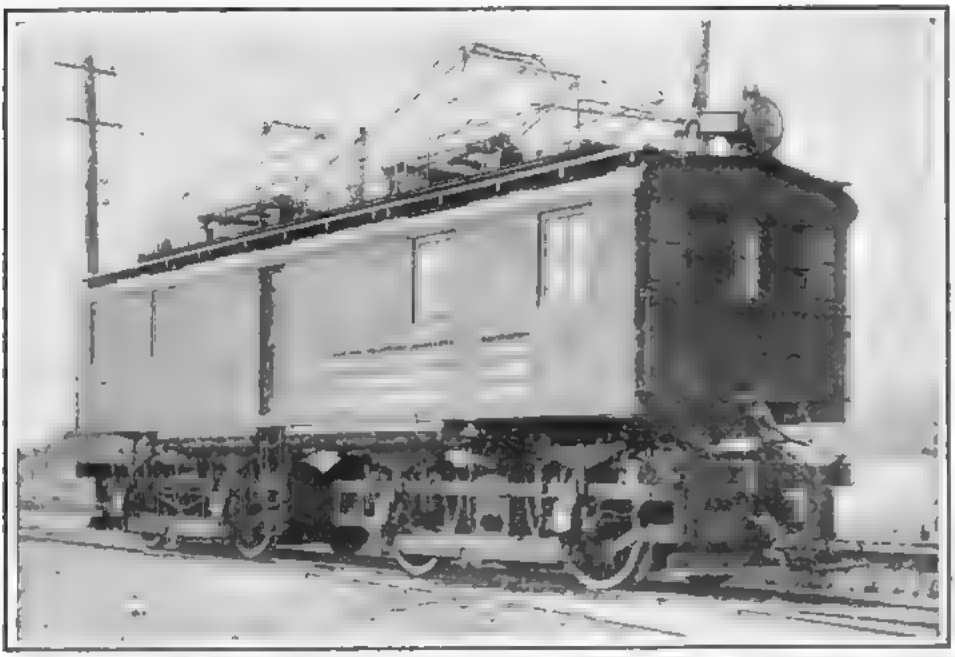
When this had been done the various parts were arranged according to size and weight, and placed in packing-cases which could be handled easily by the ship and dock cranes.

24 Cars to Haul the Parts.

It took 24 cars to handle this load, and although one of the packages alone weighed 23 tons, the loading was done and the forty-day voyage accomplished without a mishap of any kind.

The locomotives ordered for the Chilean mines are similar in construction to those in use on the Chicago, Milwaukee and St. Paul Railway, save that the former have no device for heating passenger-trains, and are without guiding-trucks.

The complete unit weighs 120 tons, and is equipped with four General Electric 1,500-3,000-volt motors having a normal one-hour rating at 240 horsepower each on 2,400 volts. Each is geared for a speed at a rated load of 12.2



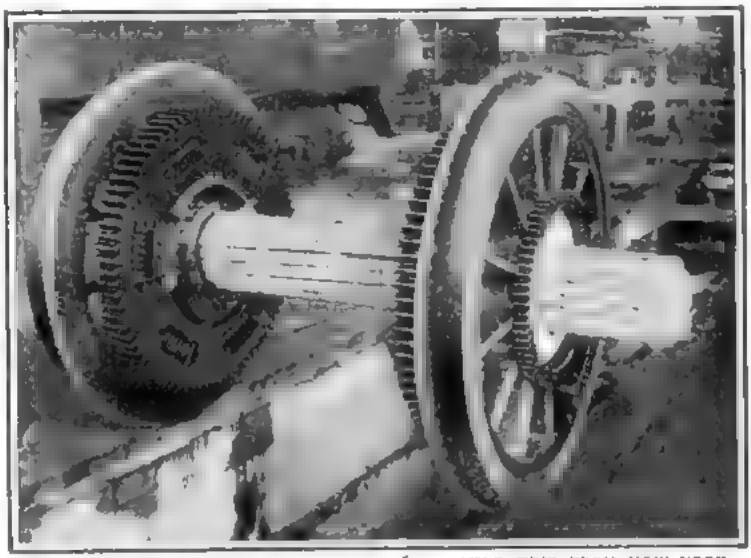
HIGH POWERED ELECTRIC LOCOMOTIVE WAITING TO BE KNOCKED DOWN AND SHIPPED IN PIECES TO SOUTH AMERICA. WEIGHT, 120 TONS. TRACTIVE EFFORT, 21 TONS. HORSE-POWER, 360. SPEED, 12.2 MILES PER HOUR. LENGTH OF CAB 46 FEET 3 INCHES. WIDTH, 10 FEET, 6 INCHES. SHE WILL HAUL FROM 10 TO 20 50-TON ORE-CARS UP A 3 PER CENT GRADE 14 MILES LONG.

FIRST THE PANTOGRAPH TROLLEYS COME OFF, THEN THE HATCH-COVERS OF THE ROOF, AND THROUGH THE OPENINGS THUS MADE THE MOTOR-GENERATOR SET, AIR-COMPRESSOR AND OTHER SMALLER PARTS ARE REMOVED, FOLLOWING WHICH THE ROOF IS DISASSEMBLED. CASES TO THE REAR CONTAIN THE PARTS REMOVED.

miles per hour, and is capable of exerting a tractive effort of 42,000 pounds at the hourly rating.

Included in the equipment, also, is a multiple-unit control and regenerative electric braking-apparatus similar to that used on the Chicago, Milwaukee and St. Paul main-line locomotives.

First the locomotives were built and assembled in the usual manner, just as if they were to be sent to some near-by town; then they were put through careful tests on tracks laid especially for the purpose of trying out locomotives under practical running-conditions. The tests were made operating under load on 2,400-volt direct-current trolley, and were thorough enough to show up the slightest defect. The regenerative braking-system was tried out with the aid of other 2,400-volt locomotives then being tested for the Butte, Anaconda and Pacific and the Canadian Northern.



PAIR OF DRIVERS MADE READY FOR A 6,000 MILE TRIP FROM NEW YORK TO SOUTH AMERICA NOTE HOW THE AXLES ARE PROTECTED FROM INJURY WITH SPLINTS BENEATH THESE SPLINTS IS A SWATHING OF FABRIC EACH PAIR OF DRIVERS WEIGHS FOUR TONS

When the locomotives were tested thoroughly and the results recorded, they were taken apart. Each part was labeled in systematic order, and the parts so arranged that the locomotive could be reconstructed again precisely as it had stood under test.

Pantograph Trolleys Come Off First.

The first step in the knocking down consisted of removing the pantograph trolleys. After this the hatch-covers of the roof were removed, thus revealing the control and regenerative braking-system. The motor-generator set, air-compressor, and other smaller parts were next removed through these openings.

The roof, which weighed some five tons, was removed while the other parts were being boxed. To facilitate the work of disassembling, the roof and sides had been constructed with nuts and bolts having suitable inside flanges when the locomotive was built. In the construction of cabs of this type, solid rivets are usually employed.

Because of the flexibility of the roof, caused by its extreme length (about 45 feet), it was packed on the platform of the locomotive after the equipment had been unfastened and stripped from it. When this had been done, all the electrical connections were opened up; the panels, contractor compartments, and other apparatus were removed, and the sides and end framing taken down.

The heaviest part of the entire shipment was the platform itself, which weighed more than 16 tons. With the roof and boxing necessary for shipment, this package alone weighed nearly 23 tons.

Next, the motors were removed from the trucks, brake rigging and other accessory apparatus disassembled, the trucks separated, and the axles removed.

For each locomotive three box cars (for the smaller packages) and five flat cars were required, the latter holding the unboxed parts and the heavier packages. When the Harlem River was reached the entire load was transferred to one of the barbor lighters, and thence to a pier alongside a South American freighter.

The entire shipment was stowed in the hold of the steamship Celia, with the single exception of the 23-ton package. This was lashed to the deck, the boxing having been made water-proof to meet this exigency.

WATCHERS.

BY PAUL STEELE.

"Electrified" railroad lines, replacing steam, are now an accomplished fact in the Rockies and elsewhere.—News.

SOMEWHERE beyond all the stars that stare
And the red-hot suns that wheel
Is a realm far-flung for the souls that dare
And do for the common weal.

Therein they are toiling as here they wrought:
Like the beat of an eagle's wings
Is the soaring flight of supernal Thought
That breathes its life to Things.

And there philosopher, guide, and friend,
In the vast, unfolding Scheme,
Are met in blending which has no end
For the good of a deathless dream.

The future is theirs, and the present, too,
And the Will, it has outgrown sleep:
The tasks are so many for them to do,
The Purpose so grave and deep!

And yet, while their ardors glow and burn
And their deft hands toil alway,
Methinks sometimes their memories turn
To a bygone earthly day.

And Watt must smile as he looks below
To the writhing ghosts of steam,
With their driving power like the winds that blow,
At the kettle which sang a dream.

And Franklin, who looked aloft for light
That wedded the night with day,
And armed a world with abiding might,
Views his kite in the selfsame way.

With *the* Inventors

A READER has asked whether wheel-flanges are sufficiently strong to support the weight of a train while traversing a crossing.

In the March number of the RAILROAD MAN'S MAGAZINE there was described a scheme for lessening the jolt at crossings by grinding down the rail until the wheel-flanges touch the bottom of the groove, although the inventor frankly admits that he has not reduced his invention to practise.

Still, there have been experiments of that nature which throw some light upon the subject. Street railways have used a somewhat similar scheme in filling the grooved portion of the rail so that the periphery of the wheel is prevented from dropping into the transverse groove at a crossover.

The light construction and reduced speed in that instance, however, make rather an unfair basis for further reasoning concerning more rigorous conditions.

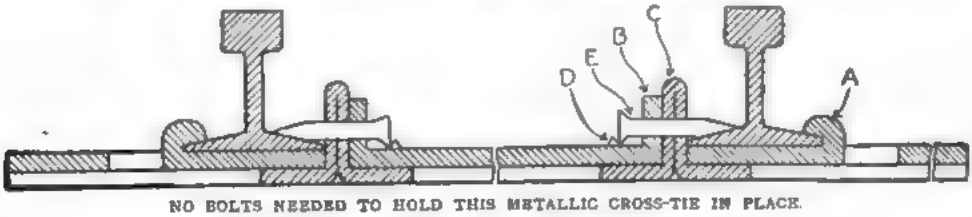
There is also a method known as the Hunt system for diminishing the fractional resistance on a curve by having the outer wheel, or that which traverses the longer curve, travel entirely on the flange. The wheels in this case seem to stand the strain very well, without breakage.

Another objection raised against the proposed crossing is that the groove would soon wear deeper under the action of the wheel-flanges, and bring the tread of the wheel again into contact with the rail. There need be only a very few inches of the groove utilized for sustaining the load, however, and that part would be of the replaceable type of construction. Possibly that would be the simplest way out of the difficulty.

In the ideal crossing of the kind under discussion, the wheel should be neither depressed nor elevated, but remain at the same level where the track is ground down and where it is normal. This can be accomplished by building up the groove to meet the flange at a point just before the wheel reaches the low portion of the track.

We inventors are inclined to be ultra-critical regarding other people's work and ideas. This is entirely unintentional, and is due in part to our inquiring minds and to the fact that no two persons would do the same piece of work in precisely the same manner. It may be, too, that we have a touch of that temperamental disposition said to be the musician's stock-in-trade.

The inventor, the musician, and the poet undoubtedly have the same shade of gray matter. What is an invention but poetry crystalized, solidified, or even gasified?



NO BOLTS NEEDED TO HOLD THIS METALLIC CROSS-TIE IN PLACE.

BOLTLESS CROSS-TIES.

THE metallic cross-tie without bolts has been the subject of some thought among inventors of late Patent No. 1,212,217 covers a form produced by P. J. Harrigan, of Harrisburg, Illinois.

The tie consists of a plate or bar in which a part A is bent upward into the form of a hook to clasp the base of the rail A vertical lug B is

similarly bent up from the tie, and has a hole in it for a spike

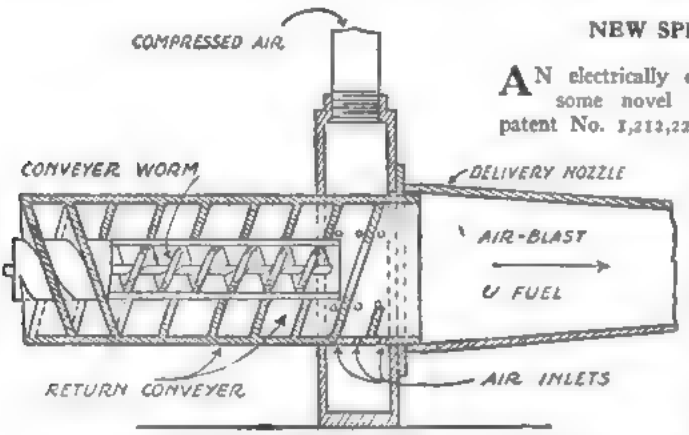
A detachable clip C passes up through the tie and also has a spike-hole. The drift spike E is driven through the holes in the lug and clip and, bearing upon the rail-base, holds it firmly in position.

In order that the spike may not work loose, the head is adapted to pass over and engage a securing rib D.

The design is such that the parts can be readily replaced or repaired. For example, if the hook A should break, a clip similar to C could be substituted. If the lug B should break, the clip C would still retain the spike in position.

PULVERIZED-FUEL SYSTEM.

A PULVERIZED-FUEL system has been perfected by V. Z. Caracristi, of Albany, New York, who has assigned his patent, No. 1,214,753, to the Locomotive Pulverized Fuel Company.



CONVEYER WORM CARRIES FINELY CRUSHED COAL TO THE FIREBOX, OXYGEN BEING MIXED IN ON THE WAY. EXCESS FUEL RETURNS TO THE SUPPLY COMPARTMENT

The invention has for its object the conveyance of finely crushed coal from the supply to the firebox, and during the passage mixing the coal with the proper amount of oxygen, preferably by means of an air-blast.

The proportion of fuel is capable of regulation to suit various requirements, and the arrangement is such that any excess of fuel over that mixed with air is returned to the supply compartment.

A conveyer worm carries the fuel forward until it is taken up by the air-blast and transferred to the furnace. Any excess fuel from the conveyer worm falls down into the return conveyer, and at once begins it rearward trip.

Both the conveyer worm and the return conveyer are rotated by any suitable means, and in addition to the rotation the air-blast can be used to aid in returning the fuel excess.

AUTOMATIC STREET-GATE.

WE no longer regard with awe the mysterious door of the novelist that opens at the approach of the hero and closes behind him in silence

Neither does the flagman at the street-crossing look with suspicion upon the gate that lowers automatically and shields the venturesome pedestrian or driver from the passing train. In fact, the flagman rather welcomes such an accommodating gate, actuated by an electric motor, the current for which is switched into circuit by lever-arms operated by the thundering limited as it passes.

Of such construction is the new railway gate, invented by F. A. Grant, of Cortland, New York, the patent for which is No. 1,203,536.

NEW SPEED-CONTROL.

AN electrically operated speed-control with some novel features is the subject of patent No. 1,212,224, secured by L. W. Horne and W. N. Crane, of New York.

The invention is of the type which causes the automatic application of the brakes when a train passes a signal set at "danger" at greater than a predetermined rate of speed, but does not operate when the speed of travel of a train is below that predetermined rate

"In brief," say the inventors, "it is the purpose of this device to correct the neglect of the engineer in omitting to slacken speed when approaching a danger signal, but to not interfere with the engineer's control of his train if he is properly observing the signal indications."

Local track and train electric circuits are employed in the operation of the apparatus, and there are two contact shoes ingeniously arranged near the track in such a manner that a train traveling between them at too great a speed will operate the speed-control and be brought to a standstill

STOP! LOOK! LISTEN!

A MOVABLE traffic-sign such as those displayed at many of our street-corners should be placed near the highway crossings, ac-

cording to H. A. Harrison, of Sykestown, North Dakota, and he has embodied his idea in patent No. 1,211,841.

The sign should be located on the highway, back from the crossing some distance, and no traffic manager is necessary, as the apparatus can be operated very inexpensively by any passing train.

The sign is connected by cables to a drum or pulley situated at the crossing, and a similar cable runs from the drum to two levers—one near the crossing and the other far down the track.

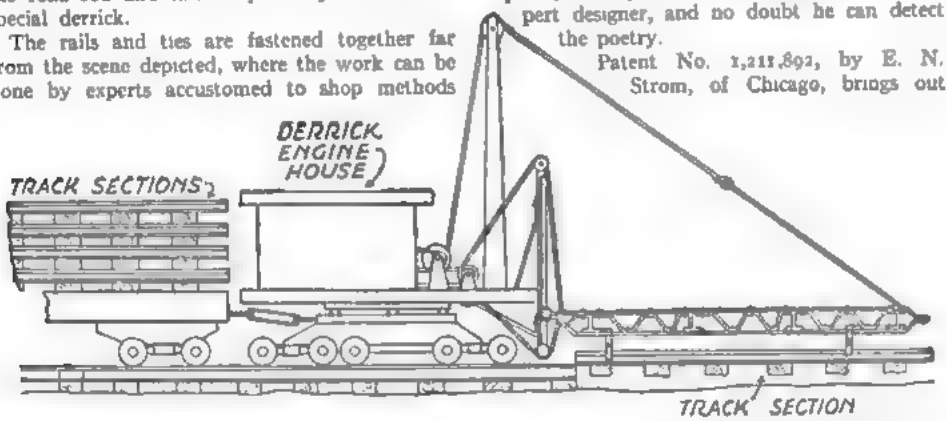
An approaching train strikes first the distant lever and sets the signal to the danger position. When the crossing is reached, the near lever is struck and the sign readjusted, permitting the resumption of highway traffic as soon as the train has passed.

Simply the word "Stop" is appropriated for the sign, but any of the usual warning words are suitable, even the old standard one of "Stop! Look! Listen!"

LAYS TRACK SECTIONS WHOLE.

PUTTING a railroad on a train and transporting it to some distant point is rather unusual, but it can be done in rather a simple manner. Whole sections of track can be put together in a machine-shop, and then carried to the road-bed and laid in place by means of a special derrick.

The rails and ties are fastened together far from the scene depicted, where the work can be done by experts accustomed to shop methods and the use of machinery. It is claimed that under such ideal conditions the workmanship is necessarily better and the finished product superior to that produced in the open.



WHOLE SECTIONS OF TRACK CAN BE PUT TOGETHER IN A MACHINE-SHOP, AND THEN CARRIED TO THE ROAD-BED AND LAID IN PLACE BY MEANS OF A SPECIAL DERRICK.

In the operation of laying the track, the boom is raised, and the derrick revolved on its turntable until over the truck, where one of the sections is grappled. Once more the derrick turns until its burden can be deposited in the proper position, when all that remains to be done is to join the rails with the usual fish-plates and pack the road-bed about the ties.

The invention is by A. Lightell, of Port Allen, Louisiana, assignor of one-half to J. Murray, of New Orleans. The patent is No. 1,215,172.

WINDOW ATTACHMENT.

A SHELF for the window is rather convenient at times, and the one invented by W. H. Sammons, of Ely, Nevada, is well adapted to receive the usual small articles that add comfort to a journey, including a cup of coffee from the dining-car, if desired.

But the device is more than a mere shelf, for a simple twist of the wrist sets it at an angle with the padded side out, and forms an excellent rest for the head in case a weary traveler wishes to spend a pleasant half-hour in dreamland.

And there is still more to the story, for when the contrivance is not in use as a head-rest or a shelf, it can be placed across the lower part of the window to act as a wind-shield and protect one from that treacherous draft.

The patent number is 1,207,330.

THE PARTS OF A CROSSING.

TO the unpractised eye a crossing is but a prosaic conglomeration of iron, and yet there is poetry in a good crossing, according to an expert designer, and no doubt he can detect the poetry.

Patent No. 1,211,892, by E. N. Strom, of Chicago, brings out one point which designers in all lines strive after, and that is the simplification of parts.

The portions forming the square between tracks consist of four exactly similar castings, while the four outer corner-pieces are likewise exact counterparts, and into a space between the midsections and the corners the ends of the rails fit neatly and are securely braced and bolted.

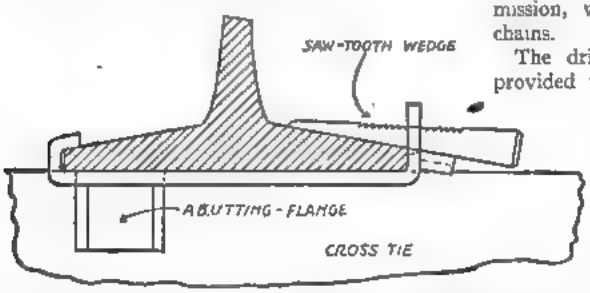
There is a certain amount of elasticity to the

joints, which the inventor claims is rather an advantage, tending to ease the effect of the pounding to which it is ordinarily subjected.

ANTICREEPER.

WE asked a prominent railroad man if his company had had much trouble with the creeping of rails, and he replied:

"Why, yes; if you sat long enough on one of our rails you could ride from New York to Philadelphia without paying fare."



THE STRAPLIKE PIECE OF METAL CLASPS THE RAIL FIRMLY OWING TO THE SAW-TOOTH WEDGE, WHILE AN ABUTTING-FLANGE BEARS AGAINST THE CROSS-TIE. THUS IT IS DESIGNED TO PREVENT RAIL-CREEPING.

We did not ask him about the return trip, as we thought that he had stretched his imagination far enough, but the point was well illustrated.

The influences tending to produce creeping are the vibrations of the rail and the expansion and contraction due to heat and cold.

A new preventive device, or anticreeper, comprises a straplike piece of metal, made to clasp the rail firmly by having a saw-tooth wedge driven through a hole at one end. An abutting-flange is bent downward so as to bear against the cross-tie and prevent relative movement of the rail.

The patent is No. 1,214,689, issued to Edward Laas, of Chicago, assignor to O. R. Barnett, of Chicago.

WORM DRIVE FOR RAILWAY TRUCKS.

THIS invention is for use with self-propelled railway-cars, preferably those run by internal-combustion engines, although other forms of motors could be suitably mounted on the framing and employed as a source of power.

Among the objects kept in view is the provision of a comparatively noiseless power-transmission, without either bevel gears or drive-chains.

The drive-shaft is centrally located, and is provided with two universal joints that allow for slight relative movements of the axles when rounding curves.

Can it be that we shall one day take our little autocar for a spin of a couple of hundred miles on a railway, with the limited express trailing us far in the rear?

The patent number of this invention is 1,216,064, and the inventors are W. H. Buckingham, of Mount Tamalpais, and H. S. Johnson, of Mill Valley, California, assignors to the Hercules Motor Patents, Inc., San Francisco, California.

HOW TO BUY PATENT PAPERS.

WE print with each invention described the number of its patent papers. Readers wishing to secure more minute details and drawings of these patents can order from the United States Patent Office, Washington, District of Columbia, by giving the number. The government charges five cents each for patent papers. Remember that stamps or other forms of currency are NOT taken. A five-cent coin must accompany each single order.—THE EDITOR.

THE SUPERINTENDENT OF MOTIVE POWER SAYS:

SUPERHEATED STEAM is found in locomotives and loungers.

FROM THE RAILROAD MAN'S MAGAZINE.

CONDUCTOR "POP" INTERFERES.

"'Tis a Harsh World for Those That Won't Stand Hitched"—and for Those Who Jump at Conclusions.

BY EMMET F. HARTE.

HE jerkwater branch line from Centralia to Red Hill (and return) is merely a weed-grown right-of-way traversed by the proverbial two streaks of rust; but "Pop" Pardee is an institution. Pop is technically known as the conductor on mixed train No. 1 (which is likewise No. 2 returning from Red Hill), a freight and passenger conveyance that perambulates daily—except Sundays—departing duly from Centralia at 8 o'clock A.M., rain or shine, and rearriving at that same bustling terminus any time from 6 P.M. to midnight of the same day.

But Pop is more than just con in charge of train No. 1-2. He is an old-timer, having run the first train on the Red Hill branch twenty years ago; and he is a local oracle, mentor, philosopher, and friend, esteemed by all that countryside, a sort of prophet and patriarch grown grizzled and rubicund and rotund in the service

People bring ponderous questions of social, religious, political, and economic significance to Pop for elucidation; he is their cherished go-between, connecting them with the world at large; their Hermes, or messenger to the court of Olympus, who is to be relied upon to bring anything from the latest news from the great war to a bottle of liniment for grand'ther's rheumatism.

Twenty years is quite a while, and a man is indeed a poor mixer if he fails to widen and deepen his acquaintance with his fellows, as the weeks, marching in sets of four, swing past with the ceaseless parade-review of the years. Pop Pardee hadn't neglected his opportunities in this particular. In twenty years he had attained a Christian name calling intimacy with nearly every man, woman, and child along the line.

Barefooted urchins and shy little maids with red hair-ribbons from the back clearings, grew up, married, and brought yet other breathless, wonder-awed babes-of-the-wood to ride on the choo-choo train and be made much of by the big, jolly, twinkly eyed man with the dusty blue cap, who carried a shiny thing that went *snap-snap* and bit holes in the tickets with its one tooth.

Pop wasn't called Pop when the Red Hill line was first opened for traffic. He was only thirty-five then, and his hair was curly and brown; nor was he so bulky of body by perhaps half a hundredweight. Time had mellowed and ripened his philosophy of living even as it had matured his sense of humor, but at the same time his eyes had lost none of their pristine clearness, and his heart and arteries were still young.

And now to the plot pertinent.

Pop paused in the aisle of his ancient and squeaky day-coach, bracing himself unconsciously against the lurch as the train swung into a curve. Old No. 34 was stepping along at a twenty-five mile clip for a moment that morning.

From the seat at his right hand a young woman half-smiled up at him with a nod of recognition. She had two small children with her; one a little man of three

years whose fat legs hardly reached to the edge of the seat, and the other a sight-seeing miss of five with her round, pink face pressed against the window glass in eager scrutiny of the marvelous moving panorama outside.

Pop knew the young woman's identity with a second glance.

"Susie Brashear," he said. "My! My! The last time I saw you you wasn't out of short dresses. How's old Bill, your pa? And your mother, too? Let's see, it's been ten years since they moved away from this country, I reckon.

"These your little folks? Just think of that now!"

He sat on the arm of the seat and shook hands solemnly with the boy-babe, whose tongue had been "stolen by the cat, of course."

"Pa and ma are getting along just fine," the young woman told him. "They live over in Putnam County, now. Yes, these are my two babies. I've been married over six years. My husband's name is Walker; maybe you know him — he works in the freight-house in Centralia."

Pop shook his head.

"No, I don't think I do. I see you're going to Sangster," he added, noting the ticket she had given him.

"Yes. We're going to visit at Uncle Henry Sampson's, and round among the old neighbors for a month or so. It 'll do the kiddies good to run wild in the country for a while. And me, too."

"I bet you it will."

Pop stopped to peer out of the window at a man plodding along the wagon road which ran parallel to the track. The train had slowed down to a snail's pace as the engine coughed and labored up a long grade.

"There's Andy Simms hoofing it to town," he said. "'Scuse me, little sister, till I raise the window a minute. No, stand still; you can look out just the same." His voice reached the pedestrian in the dusty road.

"Hi, there, Andy! Going to town?" and upon the other's affirmative gesture:

"All right, hop on and ride, without you're in a terrible hurry. Step lively and you can catch the hind end easy."

The man quickened his pace to the rear platform of the coach, where he and Pop presently engaged in a tremendous argument about the merits of feeding silage to dairy cattle, further complicated by the outrageous increase in the price of shoe-leather.

II.

It so happened that train No. 2 on the Red Hill branch, with Engineer Malone and Conductor Pardee active and officiating as usual, pulled into Centralia within ten minutes of "on time" three or four evenings after the events chronicled in our first chapter. To come that close to their running-schedule was almost a record in a dozen years.

Pop actually walked homeward in the garish light of broad day, as it yet lacked a little of seven o'clock. Pop thought of that hoary jest about the man whose own kids asked their mother "who the strange man was that come for supper?"

As he walked along he fell in with a switchman by name Evans, or possibly Stewart. Or was it O'Halloran?

The two of them, walking along together and conversing amicably and learnedly about this and that, remarked a black haired and somewhat flushed young man tacking across the path ahead of them. By the course he was steering it was evident that he had at least "several schooners aboard"; to pursue the nautical figure further, he might 've been described as "some sheets in the wind," not to say "half-seas over."

"There's a fellow," quote Stewart or O'Halloran, "that's traveling the gait. I can see his finish. Some of these Saturday evenings he'll hear something jangling and find they've tied the tinware to him at the place he works."

"I bet you," agreed Pop with mild interest. "Who is he, did you say?"

"Name's Walker. He works over at the freight-house."

Walker. Freight-house. On the screen of Pop's inner consciousness was flashed a cinema picture of Susie Brashear's animated, trustful, almost girlish face, flanked on either side by the shining, cherubic, pansy-faces of her two tots.

So, this was the man she had married, was it? A booze-fighter! A fellow who was traveling the gait. An ally of John Barleycorn, whose henchmen as a rule do not long confine themselves to mere liquor drinking alone.

Gambling, women, and brawling usually follow as a natural sequence. And too often brutality toward the innocent ones at home; if not actual physical mistreatment, then in deprivation of things that make life worth living, in petty ill-nature and neglect. Booze is a valiant fighter of the women and kids.

Thus Pop ruminated to himself as he strode toward the young man. He steadied that worthy with a hairy hand on his arm.

"How many drinks have you had, my young friend?" he asked a little bruskly.

The other stared. His questioner was evidently a stranger.

"G'wan, grandpa," he said thickly. "What do you care? Or was you thinkin' of buyin' one yourself? 'N that case I beg to report I've only had ten scuttles o' suds since I quit work at six o'clock."

"And that was ten too many, son," said Pop without smiling. "The road you're traveling is the road that leads to —well, several places, none of them just exactly where a regular man-sized man would rightly choose to land. Asylums, penitentiaries, jails, almshouses, hospitals, charity missions—booze is the stuff that keeps 'em all crowded. Think it over.

"My name's Pardee. Men call me Pop for short. I run a train on the Red Hill branch. I hate to see any man walking crooked, particularly you."

He removed his restraining hand, and turned to walk off with his friend. The self-confessed suds-bibber stood goggling, open-mouthed, after them for a moment, then with a grunt of disdain he proceeded on his zigzag course and presently disappeared beyond the swinging doors of a drink emporium farther down the street.

Pop Pardee frowned darkly over his supper.

"It's a bad business," he growled, "a shameful, miserable, sad, bad business. It's the devil's own brace-game in fact."

"What's the matter now?" asked his wife.

"Nothing," he told her, looking up with his usual cheery smile. "I was just cogitating to myself, that's all."

Two weeks passed before the recreant Walker came within Pop's ken again. Coming out of a moving-picture theater one Saturday night, accompanied by his wife—the movies were their favorite relaxation on Saturday nights—Pop found himself face to face with the black-haired young man from the freight-house. The latter appeared to be sober; he was just entering the theater, and an overdressed, gum-chewing, much-rouged young woman was clinging affectionately to his arm.

He caught Pop's indignant and accusing eye upon him, and his glance wavered with all the outward semblance of inward guilt.

"The rascally pup!" muttered Pop, giving way to his feelings audibly.

"Who's a rascally pup?" asked his wife.

"Nobody. I was just communing with myself," he laughed. "Let's cross over at the next corner and buy a sack of hot buttered popcorn."

The blind goddess of chance—or is it justice who always appears in public with a bandage over her eyes? Perhaps both of them are only feigning blindness if the real truth were known—but be that as it may, it so happened that Pop saw his wayward young friend Walker on three separate evenings during the following week. On one occasion the scapegrace was only mildly "lit up," as the saying goes; the second time he was in the beatific state of noisy stimulation called "ory-eyed"; and in the third and last instance the fellow was "plumb pickled," able

only to "navigate" by the assistance of two of his coroysterers.

Pop was beginning to adjudge the case hopeless. His throat tightened with sympathy for Susie and her babies.

Sunday being his day of rest, he strolled down to the dog-house in the yards during the afternoon to swap yarns with the boys. There he usually heard the latest news about matters local, national, and international. Yardmaster Dolan was in the midst of a graphic recital concerning an incident of which he was the eye-witness.

"'Twas as pretty a scrap as you'd pay a dollar to see at the Lakeside Athletic Club," he enthused. "You see, the foreman over here at the freight-house had already touched a match to this young Walker boy, Saturday noontime; paid him off and told 'm to skidoo. I understand he fired 'm for drinking and carousing round of nights, and shooting craps, and general cussedness. He's a tough lot, this Walker, it seems.

"Well, the lad beats it over to a groggery and proceeds to load up on fighting spirits. Along about four o'clock back he comes and starts a rough-house with the foreman. I was there at that time

"'Twas a fine fight. The Walker lad had the foreman partly licked when the cops came and took him away in the wagon. Some pacificist must 've sent for 'm.

"Me, I never meddle into a good fist-fight. 'Tis wrong to interfere when the parties interested is trying their best to settle the difficulty themselves.

"I see by the morning paper," he concluded, "where they had the Walker lad before the night court, and handed 'm the usual twelve and costs; it also said as he had no money he went to the jug for thirty days. 'Tis surely a harsh, unfeeling world for those that refuse to stand hitched."

III

On Tuesday afternoon—how the days elbow and jostle one another in this plodding tale!—on Tuesday afternoon, as Pop's train clacketed along on its return trip, she that had been sweet Susie Brashear brought her two tots and her big suit-case aboard at Sangster. She looked rosy and happy, and the children were brown as russet apples. She gave Pop a ticket to the next station, Elmdale, five miles distant.

"We'll be going all the way into Centralia with you to-morrow," she said. "I just must stop off overnight at Cousin Milly Martin's, or she'll never forgive me in the world. But we're going home sure to-morrow."

"I—I thought you was going to stay a couple or three months," Pop stammered "Sho! I wouldn't rush back home in such a big hurry."

"Oh, but we've been away an awfully long time now," she protested. "Going on three weeks. That man of mine will think we've run away for good. He'll be tickled to death to see us; and we will him, too, I guess," she added naively "You know, the poor fellow never goes anywhere when we're away. He just sticks at home and mopes. He won't even go out to a picture show—"

Pop found no ready answer to that sentiment and left her. But he did a lot of hard thinking before they came in sight of the switch-lights of Centralia.

After supper that night he claimed an urgent errand down-town, and posted off hot foot for the Railroaders' Clubhouse. To the "bunch of boys" there foregathered he explained his plan at length. None of them knew the luckless freight-handler, but that was of minor consequence.

Pop's plan was simple. He passed the hat, and gave five dollars himself to start the fund. The required sum was raised in ten minutes.

"Now, a couple of you roughnecks will have to 'tend to this thing, and don't bungle it, or you'll find yourselves in bad with me," said Pop. "You'll go up and pay this young fellow's fine, and then fetch him down to meet No. 2 when she gets in See that he's cleaned up and looks half-

way decent. He's a yellow dog, and ought to be horsewhipped, but we're doing this for the little woman and kids, you understand.

"The idea is to have him there to meet her, regardless. Have you got it all straight?"

"Sure thing," they told him. "Leave it to us, Pop. We'll *bring* him, that's all. He'll be right there on the platform when you rattle in."

Pop sighed sadly when he saw Susie and her two small scions of the house of Walker waiting to board his battered day-coach. Between stations he found time to chat with her.

"I s'pose you've been getting letters regularly from that—from your man," he said, pretending to jest. "Say once a day, anyway."

"Well, not quite that often," she laughed, "but pretty near it. He's been awf'lly lonesome, he says. You know this has been the first time I and the babies have been away from him over three days in six years. Once we went to visit pa's folks and stayed three days. He said it seemed like three months."

"He knows you're coming home today, I reckon?"

"Well, I did think until this morning we'd surprise him; but at the last minute my heart failed me, and I sent him a telegram that we were coming. Of course he'll be at the depot to meet us."

"I bet you he will," agreed Pop.

No. 2 puffed into Centralia only forty-five minutes late. When they stopped to whistle for the Gulf Line crossing before backing around the Y to the station, Pop hopped down briskly and skipped across the yards in order to reach the platform first, and make sure that all was well.

The rear end of the train, with the brakeman sounding the air-whistle in warning, was approaching by the time Pop located the men he was seeking. Jimmy Riggs, fireman, and Fred Foley, a freight brakeman, had the wayward one in tow.

The latter had the abashed, crestfallen, chastened, but withal perplexed look of a man who is wondering what will happen next. Pop came close to him.

"Now, son," he growled grimly, "if you have a spark of manhood left, you'll come with me and meet Susie and the youngsters. They're on this train. She telegraphed you she was coming—did you get the message?"

"Why, I—I—" the young man's face was a study in emotions—"No, I didn't get any message—"

Pop pushed him forward as the coach came to a stop with a scraping of the brakes, and the passengers began to drop from the steps.

Susie came unsuspectingly behind the brakeman who carried her big suit-case; she bore little brother asleep in her arms, and little maid, blinking with drowsiness, followed obediently behind. They descended, the brakeman first, Susie following him, and Pop reached to lift the baby girl down.

He straightened up to find the child's mother in the arms of a tall, fair-haired young man who had materialized out of the shadows. There were kisses and little broken phrases of greeting. The tall young man took charge of little brother and the big suit-case. Susie turned to Pop.

"This is my husband, Mr. Walker," she said proudly. "He's the chief clerk's assistant at the freight-house. Pop's an old friend of everybody out where we used to live," she went on happily.

The tall young chief clerk's assistant set down the suit-case to shake hands. Then the little family party took their way toward the station.

Pop looked after them in a sort of daze.

"Walker," he muttered, and turning to Riggs and Foley, who stood near by watchfully waiting with their charge. "Walker," he repeated dreamily, staring at that worthy.

Brakeman Foley could not longer contain himself.

"Say, Pop, what's the joke?" he asked. "Was that the lady you spoke of?"

Pop waved his hands wildly

"I've got to see my engineer a minute, boys," he coughed apologetically. "Important business. So-long."

"Here, wait a minute," Riggs and Foley shouted in chorus. "What 'll we do with this guy, hey? Do you want him any longer?"

"Turn him loose," called Pop over his shoulder. "I don't want him. Tell him to beat it. He's a fictitious character."

It was probably a month later when Pop found the young man of his ill-advised attempts at marital felicitating waiting for him when he got in off his run.

The scapegrace was clean, garrulous

"I wanta thank you for what you done for me a while back," he said. "I was out on the main line and headed for the dogs, I guess. But when you guys kinda gimme a boost by gettin' me out of the jug, and all, I saw what a skunk I was

"I got me a job over at the Gulf freight-house, and I'm comin' right down the line. I been on the wagon now for a month, and my girl says if I stick a couple or three months longer she'll talk serious about joinin' in on keepin' house, with me for the star boarder. It was sure white of you fellows to help me out—"

"H-m! H-m!" said Pop.

"You've seen her," continued the other doggedly. "We met you one night comin' out of the picture show. She's a mighty fine girl, I'm here to say."

"I bet you," said Pop Pardee with emphasis.

A TUNNEL UNDER A TUNNEL.

THE UNION PACIFIC, IN ITS NEW CONSTRUCTION WORK NEAR WASATCH, UTAH, RESORTED TO A NOVEL EXPEDIENT IN LOWERING ITS GRADE WHEN IT DUG A 1,400-FOOT TUNNEL UNDER THE OLD AND HIGHER-LEVEL PASSAGE

HE KNOWS COAL!

E. E. Loomis, Lehigh Valley's New President, Is an Authority on the Mining, Hauling, and Selling of Anthracite.

BY MELVILLE HATCH.

THIS is a story of a young man who went to work in the legal department of a railroad as a clerk and came to be the president of another big line. And, in view of the fact that he is not yet fifty years old, it is easy to see it did not take him a very long time to climb to the heights.

There are a dozen different reasons why he achieved where others fail, but hard work, ability to make others loyal hard workers under his direction, and a thorough understanding of everything he tackles, tell the story of Edward E. Loomis perfectly.

Mr. Loomis is the new president of the Lehigh Valley Railroad. He was elected when E. B. Thomas resigned and accepted the position of chairman of the board of directors.

Mr. Loomis had been a vice-president of the Delaware, Lackawanna and Western.

Began in Railroad Law-Offices.

He began in the offices of the legal department of the Denver and Rio Grande, but it was not long afterward that he went to work for the Erie Railroad in the New York offices of the general superintendent. In 1894 Mr. Loomis, after graduating from the chief-clerk rank, became superintendent of the Tioga Division of the Erie, with headquarters at Elmira.

The new superintendent was still quite a young man. Lots of the old-timers on the Tioga Division looked on him as a "kid."

One day, shortly after he took charge, a lesser official who resented the age of the superintendent went into his office and began a series of questions, seemingly asking advice on minor questions. He aimed to embarrass the new superintendent—to "show him up," as it were.

"Don't you know how to do those things?" suddenly demanded the superintendent.

This was a poser for his questioner. But Mr. Loomis didn't wait for an extended reply.

A "Kid" With a Come-Back.

"The answers to those questions are all in the book of rules. You had better look them up right away," the "kid super" continued. "Come back here a week from to-day ready to stand an examination on the rules. That is all."

Chroniclers say the fellow spent the week polishing up on the rules, for he saw the new superintendent meant what he said. The examination, too, was a stiff one.

The incident quickly became public property, and instead of bringing embarrassment to Mr. Loomis, it won him a legion of friends. Four years later, when he became general superintendent of the New York, Susquehanna and Western, there wasn't a man on the Tioga Division but was a sturdy friend and supporter of Loomis.

HE ISN'T FIFTY YET, BUT THERE ARE FEW MEN WHO KNOW MORE ABOUT RAILROADING IN ALL ITS PHASES THAN EDWARD E LOOMIS, RECENTLY ELECTED HEAD OF THE LEHIGH VALLEY

Ability to win friends has been one of Mr. Loomis's best assets, and what he achieved on the Erie was duplicated on the Susquehanna. This was all the more remarkable because the men on the Susquehanna were set in their ways, and not disposed to accept suggestions as to how to do things. But a year after Mr Loomis assumed office he had an organization ready to do anything for him

By this time W. H. Truesdale had become president of the Delaware, Lackawanna and Western, and he was looking about for lieutenants of special ability in the several branches of the service. Mr. Loomis was one of the first whom Mr. Truesdale's eye fell upon, and he succeeded in inducing the young executive to assume the active management of the vast anthracite coal interests of the company, producing even at that time about five million tons per year.

Three years later, or in 1902, the board of managers of the Lackawanna Railroad elected Mr. Loomis senior vice-president of that company, placing him in charge, not only of its coal interests — mining, transporting, and selling — but also, under Mr. Truesdale, and acting for him in his absence, of all the railroad's activities.

He's an All-Round Railroad Wiz.

In the latter capacity, and as a member of the board of managers of the company, a position to which he was subsequently elected, Mr. Loomis has had a most intimate relationship to the extraordinary development of the Lackawanna Railroad, which, in fifteen years, has multiplied its market value more than five fold through a policy of physical reconstruction, efficient operation, and intelligent, traffic-getting organization. In each feature of this policy Mr. Loomis has played an active part.

It would be hard to find another man who has come to the top in the railroad business with so wide a range of experience in railroad operation, construction, and traffic, and in anthracite coal-mining, transportation, and sales.

Popular With Associates.

Mr. Loomis enjoys an extraordinary degree of popularity with the men who worked with and for him. His popularity is not of the handshaking variety, as he is a man of comparatively few words and of no pretense.

The men have prized him particularly for his "human" side, which has taught them to look upon him as absolutely fair. While a strict disciplinarian, he is ready at all times to give them a hearing and treat them not as parts of a machine, but as factors in a living organism.

Mr. Loomis is a man of quick decisions, and is specially gifted in imparting his ideas and enthusiasms to his associates. This latter faculty has contributed much to his success, as the ability to get others to catch "the spirit of the institution" is a most important factor in successful railroad organization.

The Efficiency Engineer says:

THE noblest creatures have their limitations. You can't teach a flea to shuffle his feet or a section hand to wear a monocle.

FROM THE RAILROAD MAN'S MAGAZINE

NEW RAIL LEVIATHAN.

Virginian's New Freight Locomotive Exerts a Tractive Force of 166,300 Pounds—Is World's Biggest Hog.

STANDING UP CLOSE TO THE 700 LIKE THIS, CAN ANY ONE WONDER THAT THE GIANT'S TANK-CAPACITY IS 13,000 GALLONS AND ITS FUEL-CAPACITY 12 TONS?

HERE is the biggest locomotive in the world—if the tireless builders don't turn out one still bigger between the date of this writing and the time when these pictures will have reached the public eye. Builders, by the way, have a habit of beating the press just like that

For instance, the RAILROAD MAN'S MAGAZINE published an article on the Erie's triplex 4,038, the latest accession to that famous class of Mallet compounds, of which the first had been christened the Matt H. Shay. This description of the 4,038 was a feature of the first issue in which it was possible to put it—namely, that for March — and yet that issue reached the news-stands only a few days before the Virginian Railway proudly announced itself to be the possessor of an engine that put it all over the 4,038, so far as size and power were concerned Things move fast in the railroad world these stirring times.

Both the Erie's 4,038—that impermanent world's champion of its class—and the Virginian's nice new 700, present holder of the fleeting belt, follow the same

principles of design. Each is a triple-articulated compound Mallet with 2-8-8-8-4 wheel-arrangement—a string of words meaning that each giant is really three engines in one, that the component engines have eight coupled-up driving-wheels apiece, and that all three are supplied with power from the same fire-box and boiler, according to the arrangement devised by a distinguished French engineer named Mallet.

Both the 4,038 and the 700 were built by the Baldwin Locomotive Works, and both are for use in freight service.

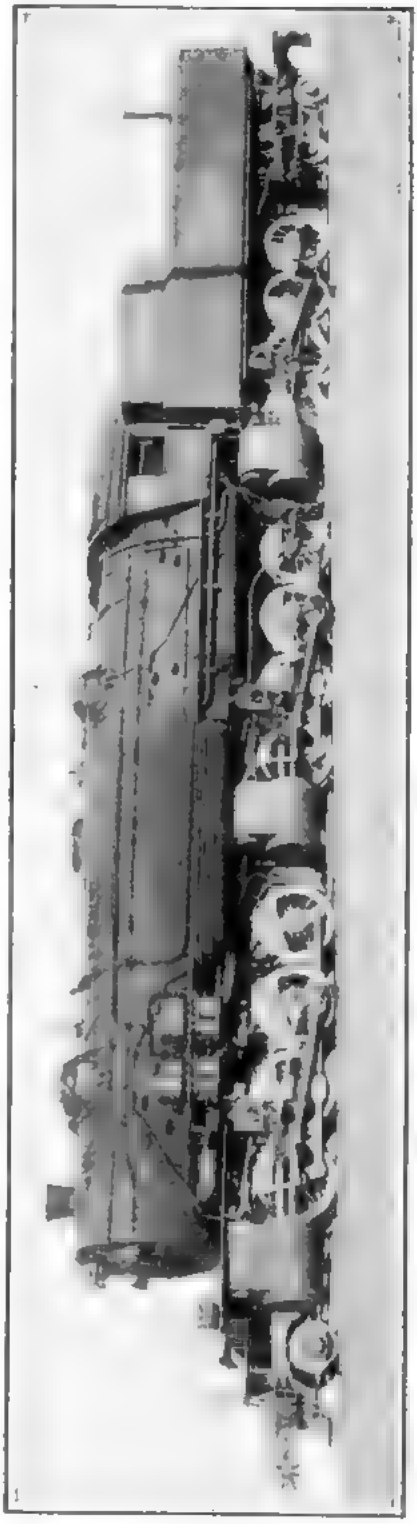
But in weight, wheel-base, and tractive force—in those dimensions that is, which make for size and power—the Virginian's pet has it on the Erie's. The weight of the 4,038, including tender, is 612,000 pounds; its total wheel-base 78 feet 4½ inches, and its tractive force about 160,000 pounds. Compare these figures with those for the new 700: total weight, 844,000 pounds; total wheel-base, 91 feet 3 inches; tractive force, 166,300 pounds

Total Length, Over 100 Feet.

In two noteworthy respects the 700 is smaller than its husky forerunner; namely, in total length and in the diameter of its driving-wheels. From buffer to buffer the Shay-class engine is 103 feet 4½ inches, while the 700 measures only 100 feet 6¾ inches between those two points. The three-foot difference is accountable to minor varieties in specifications or designing, and experts do not consider the 4,038 to be a larger locomotive simply because of the fact that it is a yard longer.

As for the diameter of the drivers, the dimensions for the Erie's engine are 63 inches outside and 56 inches center, while those for the Virginian's machine are respectively 56 and 49 inches. The smaller wheel, of course, fits the 700 to haul heavier drags and get them over steeper grades, if necessary, than would be possible with drivers the size of the 4,038

Here are some of the chief dimensions of the new Virginian's locomotive, admit-



SIXTEEN SIX-FOOT MEN COULD LIE AT FULL LENGTH, END TO END, WITHOUT SPANNING THE DISTANCE BETWEEN THIS TITANIC LOCOMOTIVE'S FIRST WHEEL AND ITS LAST—THE DRIVING-WHEELS LOOK SMALL, YET THEY ARE ALMOST FOUR FEET EIGHT INCHES IN DIAMETER

tedly the world's most powerful engine at the time it left the shop:

Gage, 4 feet 8½ inches; cylinders (6), 34 by 32 inches; valves (piston), 14-inch diameter.

Boiler.—Type, wagon-top; diameter, 100 inches; thickness of sheets, 31-32 inches, 1 1-32 inches, 1 1-16 inches; working pressure, 215 pounds; fuel, soft coal.

Firebox.—Material, steel; length, 188 inches; width, 108¼ inches; depth, front, 93⅝ inches; depth, back, 75⅜ inches; thickness of sheets, sides, back, crown, tube, ⅝ inches; Gaines furnace, length of grate, 144 inches.

Tubes.—Diameter, 5½ inches and 2¼ inches; material, steel; thickness, 5½ inches, No. 9 W. G.; 2¼ inches, No. 11 W. G; number, 5½ inches, 65; 2¼ inches, 365; length, 25 feet.

Heating-Surface.—Firebox, 359 square feet; tubes, 7,689 square feet; firebrick, tubes, 72 square feet; total, 8,120 square feet; superheater, 2,039 square feet; grate area, 108.2 square feet.

Driving Wheels.—Diameter, outside, 56 inches; diameter, center, 49 inches; journals, 11 inches × 13 inches.

Engine and Truck Wheels.—Diameter, front, 30 inches; journals, 6½ inches × 14 inches; diameter, back, 30 inches; journals, 6½ inches × 14 inches.

Wheel-Base.—Driving, 67 feet 7 inches; rigid, 15 feet 3 inches; total, 91 feet 3 inches.

Weight, Estimated.—On driving-wheels, 726,000 pounds; on truck, front, 36,000 pounds; on truck, back, 82,000 pounds; total, 844,000 pounds.

Tank capacity, 13,000 U. S. gallons; fuel capacity, 12 tons; service, freight.

JIM HILL'S COUNTRY.

BY LYDIA M. DUNHAM O'NEIL.

FECUND, but idle, the far-reaching meadows
Up in Jim Hill's country
Stretched to the line of the long mountain-shadows
Up in Jim Hill's country.
Millions of acres of drear desolation,
Destined to be the mainstay of a nation,
A big, lonesome streak on the face of creation—
That was Jim Hill's country.

AWAITING the advent of doer and dreamer
Lay great Jim Hill's country;
The hand of the builder, the plan of the schemer,
To waken Jim Hill's country.
Awaiting *Jim Hill*, whose fortuitous coming
Started wheat growing and set the wheels humming,
Little homes building and big moguls drumming,
Up in Jim Hill's country.

OVER the prairies the headlights are gleaming,
All through Jim Hill's country,
Where hundreds of hamlets and cities lie dreaming,
Up in Jim Hill's country.
The great garden-spot of a glorious creation,
The pride of the world and the pulse of the nation,
A dream that has come to its realization—
That is Jim Hill's country!

THE TRUTH ABOUT THE WRECK.

The Verdict of the Coroner's Jury Cleared Dickerson's Record, But Not His Conscience.

BY HARTLEY EDGINGTON.

PARKER had let Dickerson talk him into wasting a good half-hour. But then it had been a long time since he had seen the old man — a long time. Strange that the old man remembered him.

As for Parker, he wouldn't forget Dickerson, ever. He believed he had got most of his mechanical education riding in Dickerson's cab when he was a youngster.

Coming down the street an hour ago, he had met the old man just in from a run. And Dickerson had insisted on bringing Parker out here with him after lunch. Well, he wasn't in town but for a day or two, but he could humor old man Dickerson, he guessed.

"That is the house," said Dickerson. "We will not be noticed here in the trees, and we can see easy."

"All right," Parker answered, "but I certainly don't care to be seen."

They sat down on a bench, facing half away from the house across the street

Dickerson one would have passed on an empty street without seeing. There was nothing unusual in his heavy face. At the most it was not vicious or dissipated.

His body was blocky, his clothes cut to fit one universal man. His hands named him — square, hard hands with broken nails blackened with engine grime.

Parker looked like a man of periodic leisure and rush—as if he could take a six-figure contract through on schedule time and read his paper through every morning.

"You are sure she will come presently?" he said, looking at his watch.

"Yes," Dickerson answered. "She goes to a club or something that meets this afternoon. She will pass here in about five minutes if she is on time."

"You know her habits pretty well."

"Well, I send her eight hundred dollars every year. Perhaps that gives me a right to know her habits."

"I can't see the situation," Parker said impatiently.

But just then the door of the house opened. A girl came down the steps.

From some whim, Parker looked away as she crossed the street. He wanted to see her all at once He wanted to see at a glance what it was that had entangled Dickerson

But when she came opposite them, she turned abruptly. He saw only the side of her face. She seemed not to see Dickerson.

"She doesn't know me, you see," Dickerson said, rising. "Let's walk. I'll tell you about it as we go back"

It was a night in January thirteen years ago, when I was on the old Midnight Flier running out of Harveyburg. It was a cold night—snow and ice after a silver thaw.

In the cab, though, everything was snug. I had spent most of the evening

at the old "Crescent" on Water Street with some of the fellows. You know the rules weren't so strict then. And I was feeling warm and contented.

We went tearing along through the blackness, the old engine rocking on the rails which stretched out there ahead where our whistle and light seemed to be cutting their way through ice.

We were pulling half a dozen sleepers and making good time. Old Bill Bracken was firing with me—a good fellow. Bill could drink a lot and not show it.

We made only a couple of stops in the first seventy miles. I saw as we tore out of the block at the second stop that we were keeping up to schedule. There was a train ahead — a special, I knew. But we expected to pass it on Five Mile siding—half an hour yet.

Bill went back, and I was alone. I got to thinking about the crazy old piano in the Crescent and how that fellow could pound it. And about how the fire snapped in the stove, and how the men slapped you on the back—and a lot of things.

It was just 1.50 A.M.

And then like a flash, lights whipped up in front of us—tail-lights of the special. I snatched at the throttle—but too late. There came an awful splintering, and then I couldn't hear anything.

I think I called out when those lights burst in — or perhaps old Bracken saw them. Anyhow he jumped.

And all I could think of when I came to and saw the blackness overhead—because I was pinned down tight—all that I could think of was the signals. Where were they, the block signals that should have warned us?

I think it was the steam that kept me awake, and the crying and commotion going on around me. I don't know how long it was till they came and chopped me out.

They said that the rear car of the special was all in slivers, and another car ditched, but that most of the Flier was still on the rails.

I asked about Bill Bracken, and they pointed to a body lying at one side covered with coats. A train-lantern sat at his head, biting a little circle into the darkness. The falling snow melted on the tin, I noticed.

"Dying," somebody said.

I went over to Bill as the people drew away, and bent down. He whispered in my ear. I could hear the words, but they didn't seem to mean anything, I was so mixed in my head.

I tried to get to the wreckage of the sleeper. As I staggered along a man said: "Poor fellow! He's still crazy, but it's a wonder he wasn't killed outright."

I knew he was talking about me, but it seemed like a voice in a last night's dream.

They were all working at one end of the car. A woman in a heavy coat stood holding something in her arms. The lantern sitting in the snow lighted up her face.

"Poor little thing," I heard her say to the bundle. "Poor little thing!"

Then the axes stopped, and the men drew back. Then one bent down.

"Dead, I guess," he said, and they helped him work a woman's body out of the hole they had chopped.

They laid her near me on a blanket, and kept back the people. And I thought I had never seen such a beautiful, awful woman, ever.

Her loose, yellowy hair was all purple with blood, and even in the falling snow her eyes stared wide open, fastened on me. She was little—so little! And her body looked so white through the gown. And it seemed so terrible to let her lie there in the snow and be looked at.

She had been asleep, I figured out slowly; it was her child the other woman was holding — her child that had been right against her body, warm and sleepy—and now the snow was falling on them both—one dead in the lantern light, with her hair turned purple.

They said no one else but Bill Bracken had been hurt on the Flier. There were only three others in the rear car of the special and they escaped alive.

And then it came to me again about the signals. Why had there been no red, no yellow light, if there was a train in the block? And why not a green light to "proceed"?

Of course the absence of the green light did not make me guilty. Passing a red light, or failing to slow for a yellow, would have been the end of me as an engineer. But I had seen no light at all.

I found myself mumbling about torpedoes. And a man who was near me said that the special had been delayed removing a small slide from the track. After that, he said, the brakeman had taken up the torpedoes, and they were just pulling out when the Flier came thundering down the rails.

"But we had been in the block twenty minutes," he said. "Twenty minutes. You must have passed the lights."

The special took most of our passengers, and, leaving part of both crews, pulled on to make up its schedule.

Bill Bracken and the dead woman must be kept there until the coroner came. They took the child on to be turned over to the authorities at the next stop, because no one on the train had known the dead woman.

About seven the next morning a special came in with some of the officers of the road and the coroner. The superintendent asked me a lot of questions, and then disappeared up the track toward the block signal. The coroner impaneled his jury and about nine o'clock held court in one of the stalled coaches.

The bodies were there side by side, but now there was a cloth over the woman

"There is no question about the facts of death," the coroner began. "We are here to fix the blame if possible."

I was ordered to tell all I knew.

"I did not see any signals," I said—"not a signal of any color."

"But the signals were certainly there," said the coroner. "Did you ever hear of signals failing to work?"

"I don't know anything about it," I said.

The coroner looked at Mr. Travis, the superintendent, who had returned in time for the inquest and was sitting quietly waiting.

"If you wish," he said politely, "I will offer a suggestion." The coroner nodded. He liked politeness from railroad officials.

"Gentlemen," said Mr. Travis, "I do not believe that the signals were there when the Flier passed. That is, I believe that they failed to work. Perhaps you know that electricians have estimated that a block signal fails once in a million times—approximately. Last night was the millionth time!"

He spoke quietly, and looked around. But I was busy trying to untangle what Bill Bracken had said when the lantern light and the snow were falling on his face

"You know that there had been a silver thaw," the manager went on. "A silver thaw with a heavy freeze and snow following. If you will go to the signal-post, half a mile up, where Dickerson should have seen the red warning, you will find that it is in a peculiarly exposed position. It stands at the top of the embankment on the outside of a curve.

"The cliff across the track from it is a sheet of ice. The temperature has risen, I suppose, fifteen degrees since last night, but the top of the pole and the arms are still completely crusted with ice.

"The signal is working this morning. But it was not working last night. The cold or whatever interfered with the system at that point no longer affects it."

Travis's speech brought on a great argument. And after a while the whole party walked the half-mile to the signal-post to see for themselves.

Travis and the remainder of our crew swore separately and together that my record was clean: no other wrecks, reliable character, seen in saloons, but never drunk, never guilty of any lapse of duty. We got in telephone connection with the proprietor of the Crescent, who told the coroner that I had been there all evening until eleven o'clock, but that I had not

taken more than a couple of glasses of beer all evening.

The other crew testified for me that the torpedoes had been taken up just before we struck. An electrician who wasn't connected with the railroad company was sent for, and the jury asked him about the probability of cold or snow affecting the working of the signal system. He went over the whole situation, and said at last that it might have been the case.

By evening the jury were prepared to bring in a decision.

I was held to be not criminally responsible for the deaths of the fireman and the woman with the purple-yellowy hair. The jury congratulated me. They were honest fellows, not used to seeing dead people, and they wanted to get away.

The superintendent shook me by the hand and reminded me that my good record had clinched the other evidence. And I think he was dead honest, as a man.

I suppose I thanked him.

Well, the track was cleared, and in twenty-four hours we were running on schedule again.

Bill Bracken had no relatives that anybody knew of, and only money enough to bury him decently. Nobody in the whole world seemed interested in the dead woman.

A name—Elise Norton—was found on a handkerchief in her suit-case; that was all. The county buried her, and the woman who had taken care of the child decided to adopt it. She gave it the name of the dead woman.

And I have watched Elise Norton for thirteen years. I feel as if she belonged to me.

She does not know who sends her the eight hundred dollars every year. I send it anonymously, in bills. She only knows that I like her to be good in her studies, and kind to her adopted mother. Sometimes I send a little note with the bills. And sometimes I tell her where to leave a note for me.

And just then across the empty street in front of the two men walked Elise Norton. She looked up. Parker expected to be startled by some quality of beauty or charm—whatever it was that had caught his old friend.

Beauty! Charm! She was commonplace. Not excusably plain — commonplace. She might have been pieced together from catalogue illustrations for all the distinction she expressed.

"Dickerson — *are* you planning to marry her?"

The old man shook his head.

"No, but I hope she does get married in five years or so. I mean to look out for her till she is no longer dependent, or I am laid off. But I saw the old man looking me over the other day—with his eyes half-shut. I am getting old, all right.

"I am rather surprised though that she —that she hasn't been more eager to find out where the money comes from."

Parker pondered the kindest answer to make.

"I guess she is not very—very imaginative. And perhaps the woman warns her not to attempt finding out. But, Dickerson, you aren't responsible for her. Sending her that amount, and taking out what you spend, you can't be saving anything. And you should have something laid aside."

"Oh, the rules are stricter now, Parker. And I don't care so much about spending. I haven't been to the Crescent since the night of the wreck. In fact, I am getting interested in libraries and mountaineer schools and immigration questions."

He smiled sheepishly.

"Oh, by the way, did you ever decide what it was Bracken was trying to say to you?" Parker asked as they were parting. Dickerson nodded.

"He said, 'The signals—the signals—red!'

"The last time I looked at my watch it was 1.50. The wreck came at 1.53 railroad time, they told me. It was not the millionth time the superintendent spoke of. I was asleep."

WORLD'S YOUNGEST "VAG."

FOR Frederick Sykes, aged eleven life is simply one box-car ride after another. This youngest of vagrants, whose greatest desire in life, he tells the police, is "to see the big cities," was recently cooped up in a freight-car without a bite to eat for twenty-four hours.

Frederick first began to feel the "call of the road" early last December. Without saying a word to any one, he slipped quietly away from his home in Philadelphia late in the afternoon. The next his parents heard of him was when the police of Brunswick, Maryland, called them up on the telephone, and informed them that their wandering boy had been found sleeping peacefully and happily on the floor of an empty box car. Properly admonished by the police, the boy was sent home to his parents the next day

But Freddy is the sort of lad who gets restless if he stays home too long at a stretch. A month later the truant was picked up at Bailey's, and once again it was found that he had chosen as his means of transportation a nice, large, roomy freight-car.

And then, just as the police were beginning to settle down for a quiet spring, Master Sykes burst into view once more This time Bayview Junction, Maryland, had the privilege of acting as host to the world's youngest truant

He told the authorities at that place that he had left his Quaker City home in the afternoon, spent the night in the freight-yard, and the next day got inside a box car. Here he remained an entire day before he was found. After which he was arrested, given a bath and something to eat, and sent home. It all seems very exciting and romantic to young Sykes —this running away from home to see strange cities. And it may, perhaps, appeal to the imagination of other lads to read of his escapades. But that is because they have not yet learned the real truth about the life it all leads to, that the career of the typical ride-stealing vagrant almost invariably results in suffering, misfortune, and unhappiness

FREDERICK SYKES, ELEVEN-YEAR-OLD BOY WHO HAS BEEN FOUND IN BOX CARS IN THREE CITIES "I WANT TO SEE THE WORLD" HE TELLS THE POLICE BEFORE BEING SHIPPED HOME FOR A SPANKING

Photo by courtesy of Edmund Leigh, Supt. of P... Baltimore and Ohio Railroad

EVOLUTION OF R. R. RULES.

First Regulations Made Prospective Passenger Give Road 24 Hours' Notice and Tell Why He Wanted to Travel.

CATTLE MADE CONDUCTORS SAD-EYED.

Safety of the Lowly Kine Was Zealously Guarded, Because Train-Crews Were Docked for Killing Live Stock Nobody Worried about Human Beings; They Looked Out for Themselves—Terminal Clock Was Each System's Standard Time.

BY THEODORE BENTON.

IT has been said that rules are the product of experience; but, upon analysis, another parent must be added. For in the evolution of system, applied inexperience, too, helps some. Twin forces have merged to bring the splendid railroad scheme of to-day from the crude beginnings of a century ago.

For instance, the railroad heads of the early days were at first rather hazy themselves regarding just what rules should govern the operation of railroads. Some regulations had to be worked out from gradual experience.

And right here belongs a picturesque incident which once and for all determined who was in charge of the train. We of to-day know it's the conductor, and here's the story of how that issue was settled in the good old elemental way, with hard fists. Incidentally the story carries the origin of the railroad bell-rope.

In blazing the path to progress the railroad promoters of the early time, like other human beings, made some blunders. In the earlier days of the railroads in this country the locomotive engineer was the master of the train, the conductor having little to say.

Ayres Allowed He Was Boss.

To him was entrusted the collection of fares, the handling of freight and bawling, "All aboard!" That to-day the conductor can boss the engineer is due indirectly to the fistic ability of Captain Ayres.

The year 1842 beheld the New York and Erie Railroad, afterward the Erie, doing a thriving business. There was no rail connection with Jersey City in that year. Boats carried passengers from New York to Piermont-on-the-Hudson, which was then the eastern terminus of the road. The western terminus was Turner's, forty-seven miles from New York.

Captain Ayres, one of the pioneer conductors of this line, ran the only train then called for between these terminal

points. It was made up of both passenger and freight-cars.

Captain Ayres saw a weakness in the idea of the engineer, who could have no knowledge of what might be transpiring in the cars back of his engine, being allowed to have complete charge of the train. Even in those days vagrants used to crawl inside or under freight-cars for lifts along the way, and there was occasionally encountered a fractious passenger who refused to pay his fare, and whom it therefore became necessary to eject from the train.

So, as there was no way of signaling the engineer, and as it was not advisable to throw the malcontent off while the train was in motion, Captain Ayres put on his thinking-cap.

The result was the bell-rope. Captain Ayres got a piece of twine, long enough to reach from the locomotive to the rear car. To the end of the string next the elbow of the engineer he fastened a stick of wood. He ran the cord back over the cars to the last one.

Settled by Muscle.

Then the captain interviewed the engineer, Abe Hammil. He told Abe of the innovation and of the reason for it, and stated that, in case of emergency, if he desired Abe to stop the train, he would pull the string and raise the stick, when Abe should stop till he got the signal to proceed.

Did Abe receive this communication of Ayres in any spirit of "Get together, brothers"? Abe did not. He looked upon the plan as a direct slap at his authority over the train, so when the train left Piermont he cut the stick loose.

At Turner's, when the captain came up to the engine, he found the twine hanging. To his remonstrances Abe replied that he was the engineer, and he proposed to run the train as he alphabetically pleased. The upshot of the controversy was that Abe got a clout under the ear. The question, for all time, of the custody of the train was settled right there.

Ayres was not canned. Instead the heads of the line, to whom the incident was reported, agreed that their business would be better served to have the conductor in charge of the train. They therefore drafted a new rule to that effect, under which Captain Ayres acted for many years till he was superannuated and retired on a pension. He died in Owego, New York, aged seventy-eight years.

Despatching by Telegraph.

To the Erie, also, belongs the honor of sending the first train through by telegraph, a departure which directly opened the way from the old-style, single-track past, with rails of timber surmounted by a thin strip of iron known as "strap rails," to the majestic future of double and even four-track roads, loaded with traffic controlled by the block signals.

It is an odd thing that, though telegraph instruments were put in railroad stations soon after Morse gave to the world his great invention, it was some little time before the key was used to guide the movements of trains. Instead, word was sent to the stations between terminals giving instructions to train-crews when they should arrive, where to transfer freight and so on. Terminal clocks and siding rules still constituted the schedule of trains.

Minot Overturned Tradition.

One day in 1846, Charles Minot, superintendent of the Erie, at Port Jervis, ninety-eight miles from New York, received word to report at the metropolis in haste to attend an important meeting of the directors. The hour of meeting was arbitrary, but the line was cluttered up with passing and repassing trains.

To make the meeting on time it was necessary for Minot to have a clear track. He cleared it by using the telegraph.

Minot conceived the master inspiration. He walked into the telegraph room at the Port Jervis station, and waving aside the operator, rattled the key, calling each station in turn.

To each of the station masters he issued personal instructions to sidetrack every train over the line of march to afford a clear track for his own locomotive, bound for New York. He received each wondering employee's "O. K.," or whatever passed for that symbolism in those days, and then walked out of the station and to the iron horse.

When the engineer learned how the orders had been issued, he refused to take the responsibility of running the locomotive.

"I'll run it myself then," said Minot laconically. "You come along with me and fire."

And so it was done.

Within forty-eight hours after that trip Minot had worked out a schedule on new lines, providing for the movement of trains under the control of the key, and practically making the Erie a double-track line, advantaging the service wonderfully for those days from the standpoints of both added swiftness and sureness.

And within a month thereafter there was printed a new set of rules for the guidance of train-crews, based upon the Morse key, the potentiality of which was now amazingly increased.

Public Cut More Figure with the Years.

All old records agree that those concerned with the management of railroads pay vastly more attention to the comfort and convenience of passengers than they did when the game was young. The pioneers figured that they were doing the public a service; that said public was indebted to them for same, so that on the whole, the early chiefs of the rail were inclined to be haughty.

Indeed, the old rules paid much more attention to live stock than to passengers. It happened in this way:

The pioneer lines ran through many miles of farming and pasture country. The pastures were not protected as at present; at almost any time a train was likely to run down a cow or a sheep.

In such case the farmer could recover damages against the railroad. So in some of those original rules controlling train-crews, you will find cautions for engineers and their helpers to keep a sharp lookout for animals on the track—and you will look in vain for any mandatory instruction to said train-crews to look out in divers particulars for the comfort and safety of passengers!

The passenger paid his fare for a ride, and in those first days that's all he got. No provision was made for checking baggage, nor, under the rules regulating the sale of tickets, was there facility for interchange of cars or intercommunicable tickets. Thus in the early days a passenger traveling from Albany to Buffalo had to buy six different tickets over six different lines.

Had to Warn Them He Was Coming.

But the first English railroad actually made it hard for the passenger to travel at all, let alone making it hard for him after he got aboard. According to an undated "Copy of the Rules for Travelers on the First Railway," a document which is still preserved by the Manchester to Liverpool line:

1 Any person desiring to travel from Liverpool to Manchester, or *vice versa*, or any portion of the journey thereof, must twenty-four hours beforehand make application to the station-agent at the place of departure, giving his name, address, place of birth, age, occupation, and reason for desiring to travel

2. The station-agent, upon assuring himself that the applicant desires to travel for a just and lawful cause, shall thereupon issue a ticket to the applicant, who shall travel by the train named thereon

3. Trains will start at their point of departure as near schedule times as possible, but the company does not guarantee when they will reach their destination

4 Trains not reaching their destination before dark will put up at one of the several stopping places along the route for the night, and passengers must pay, and provide for, their own lodging during the night

5 Luggage will be carried on the roof of the carriages, if such luggage gets wet, the

company will not be responsible for any loss attaching thereto.

Some of the rules in force on the old Western Atlantic seventy-five years ago have a ring hardly less quaint than the above. For instance:

Each engineman will keep a watch which must be regulated by the time of his conductor at the commencement of each trip, and will always have in his possession the current schedule book

Should any stock be killed which may be likely to endanger the safety of the next train passing, the engineman will stop his train until track is cleared.

In connecting and in starting with his train, the engineman will be exceedingly careful in the management of his throttle so that the cars may not be injured or the passengers annoyed by the violence of the start.

When a train is approaching a stopping place, it is the duty of the engineman to see that his fire is regulated so that it will not be necessary to blow off steam while the engine is stopped.

All engines running at night, out of time, must keep their dampers open so as to show a light.

When an engine is to be followed by another at daytime, the forward engine will have on its buffer a red flag spread.

If no engine is to follow during the day, then the flag must be furled and bound to the staff.

As a general rule, when trains meet between stations, the train nearest the turnout will run back. Any dispute as to which train has to retire is to be determined at once by the conductors, without any interference on the part of the enginemen. This rule is required to be varied in favor of the heaviest-loaded engine or the worst grades. If they meet near the center, in case of backing, a man must be placed on the lookout, so that any danger to the rearmost part of the train may be seen and the engineman at once receive notice. The backing must be done cautiously.

For any violation of the above rules, for running off at turnouts, for all other irregularities, the general superintendent will impose such fines as he deems just and called for by the nature of the offense.

Just to show how the technic of railroading developed in the succeeding generation, here is a copy of a document that is mighty hard to come by in these days. Railroading, it will be observed, was still a mighty primitive thing compared with its present-day scientific precision, though it had made great strides over the days represented by the lists of regulations given above:

UNION PACIFIC RAILWAY.

TIME-TABLE NO. 1, TO TAKE EFFECT AUGUST 23, 1 O'CLOCK P.M.

WEST BOUND				EAST BOUND		
Train No. 1	Train No. 3	Miles from Omaha	STATIONS.	Miles from Kearney	Train No. 2	Train No. 4
p. m.	p. m.				a. m.	a. m.
1 00	7 00		Omaha	190	3 00	10 00
*2 10	8 15	12	Papillion	178	*2 10	9 05
3 45	10 00	28	Elkhorn	162	1 00	7 50
5 15	11 45	46	Fremont	144	11 45	6 30
6 30	1 30	61	North Bend	129	10 55	5 25
7 45	2 30	75	Shell Creek	115	10 00	4 25
*9 00	*3 15	91	Columbus	109	9 00	*3 15
10 40	4 45	109	Silver Creek	81	7 45	2 00
12 20	6 30	131	Lone Tree	99	6 40	1 22
2 10	8 10	153	Grand Island	37	5 10	10 20
3 40	9 40	171	Wood River	29	4 35	*9 50
5 15	11 10		Kearney		3 00	8 00
a. m.	a. m.				p. m.	p. m.

* Meeting-points.

RULES AND REGULATIONS.

1. The clock in the cashier's office at Omaha will be the standard time, and conductors and enginemen will regulate their timepieces by it.

2. Trains going west will have the right of track for one hour behind time. If not then at meeting-point, train going east will proceed, keeping one hour behind card-time, until meeting westward-bound train.

3. At meeting-points conductors will allow five minutes for variation of time, if trains due have not arrived.

4. Trains going east will side-track at meeting-points.

5. Trains will leave Omaha and Kearney on time, whether trains due have arrived or not.

6. Conductors are authorized to call on division men for assistance in case of accident, and in loading and unloading cars.

SIGNALS.

7. A stationary red flag by day or lantern by night denotes that the track is imperfect and must be run over with great care A red flag by day or red lantern by night waved upon the track signifies that the train must come to a full stop. The waving of a hat, or any like action shall be re-

garded as a signal of danger and not passed unnoticed

8. A red flag by day, or a red light by night displayed on front of an engine indicates that an engine or train is following When necessary to stop a train on account of obstructions or other dangers, the signal must be displayed forward and back at least half a mile from such obstruction or danger.

9 A lamp swinging across the track signifies to stop. A lamp raised up and down, go ahead. A lamp swinging over the head, back up.

10. One stroke of the bell signifies to stop Two strokes, go ahead. Three strokes, back.

11. One puff of the whistle is signal to set brakes and stop. Two puffs is signal to loose brakes, and three puffs a signal to back up

12. Trackmen must use good judgment and caution at all times, as under the telegraph system of working the road a train may be along at any moment. At all times when a rail is to be taken out or other work done which will render the road impassable for trains, a man must be sent out in each direction with proper signals to warn approaching trains. If work is being done which will render the track unsafe for trains running at their usual speed, a stationary red flag must be set at least 600 yards from the spot

SAM'L B REED,
General Superintendent.

Omaha, August 22, 1866

In the handling of freight-trains the rules governing train-crews were lax, in so far, at least, as they related to the convenience of the public. Men now in middle life will remember how, in villages and even in large towns in the early 80's, throughout the country, a freight-train would stand across a public crossing, sometimes tying up vehicular traffic for hours at a time.

But time has changed all this, and be it recorded forever to the credit of the courtesy and good sense of men in charge of railroads, it has been only in isolated cases that the changes have been forced by public opinion. In most cases railroad heads have anticipated public opinion, and have taken the initiative in the reform of abuses which, after all, came from no desire adversely to affect public privilege, but only from that inexperience in operating which time remedied.

Rules imposed by the big railroad systems governing freight-crews now limit generally throughout the country the time that freight-trains can occupy public crossings to five minutes. If that time is overrun, it is now usually required that the train be split in two to allow of the progress of interrupted traffic by the crossing.

That passing honest beast, the horse, played his part, too, in the early days of railroading in the metropolis. In the early 60's the New York Central trains ran to Thirtieth Street. There the engine would be uncoupled, teams of four and six horses would be hitched on to each car, still loaded, and the brave steeds would come dashing down to the terminal at Chambers Street and West Broadway, where the trains would be made up again.

The New Haven road employed the same expedient. It had a station on Canal Street, east of Broadway, and another on Third Avenue, and employed Dobbin in the same way to drag the cars between stations.

Important Change in the Lights.

Since 1903 there has been an important change in the detail of the lights governing the safe transit of trains. The pioneer in the light system, enduring from the railroads' earliest days, is the red lantern, which has always signified danger. From this single lantern sprang the varicolored lights which under stringent rule to-day control the operation of trains.

But for the betterment of the service generally the big systems eight years ago evolved a uniform light system which has been found to work very satisfactorily.

In the old days the showing of a green lantern meant to proceed with caution Since 1908 it has meant "clear." Yellow is now used to flash "proceed with caution." Red will undoubtedly always mean, as in the past, "Stop!" It means danger ahead

Ideally, a white light would signify

"clear," and a white light was employed in the old days, but it didn't work satisfactorily for the reason that there were too many white lights that were doing service outside a railroad.

For instance, if an engineer were approaching a spot where a white light should be flashed, and that light should for some reason be extinguished, there might be a white light from a contiguous building that would mislead him, and an accident might follow.

Hence, the big systems experimented, with the result that the green light was found to be most satisfactory as the "clear signal," and since that time it has been used.

Rules Were First Pasted Up.

In the earliest days what rules were required for the guidance of the employees of the short original lines were written and pasted up on the walls of the stations. They consisted mainly of broad definitions of duties to be performed, and were largely devoted to warning crews to look out for the safety of live stock encountered along the way.

In some cases engineers were cautioned that, should the deaths of any of these devoted animals be found due to their carelessness, they would be expected to reimburse the road out of their wages by the instalment plan! Those were the early days, true enough.

Later the rules were printed upon the time-tables, when evolution brought the latter convenience alike for the public and the employees of the road. It did not take long to master them, for the list was short, nor were there any official examinations in those days.

This is in strange contrast to the order of things in the present day, when not only is an aspirant for position required to pass a perfect examination in the rules of his job before he starts work, but has also to pass another every time there is a wholesale revision, which on the big systems usually occurs every few years.

Also, there is likely to descend upon him at any time some official with oral questions of a leading nature; and if it develops that he has been too sluggish mentally to acquaint himself with the full details of his position, his job is immediately taken by some aspirant with more ambition.

Suppressing the Noise Nuisance.

In the matter of unnecessary noise by locomotives on railroads, investigations show that the officers of the roads have in the great majority of cases taken the initial steps toward mitigating a situation that was frankly a nuisance as late as the 80's. Various rules have from time to time been promulgated by the heads of operating departments lessening the commotion of traffic in and about terminals, and as far as possible, especially around sleeping-cars at night, reducing it to a minimum.

To this end various regulations have prescribed the ringing of bells and the signals of the whistles. Some of the big systems, in fact, have during the past two years installed a so-called "siren" whistle in place of the shriller old-time gongs. This is an invention which, while the sound travels as far as did the original discordant blast, imparts to the tocsin a soft, mellow tone that is as pleasing close at hand as at a distance.

You Can't Ride with the Engineer.

In days of old it used to be esteemed a great privilege to ride in the cab with the engineer. It is still so esteemed, but it is now a privilege you can't get.

For the railroad powers have more and more appreciated the tremendous public responsibility that is invested in the man at the throttle, and adhere more rigidly than ever to the theory that his companionship should be limited to his fireman.

Every book of rules of every big system to-day provides that no person shall be allowed to ride in the cab with an engineer without written authority from the railroad men "higher up." You try to get such a permit nowadays and you find

yourself going higher and higher. Then you come down again — mostly without the permit.

A man who himself superintends the metropolitan operation of one of the biggest Eastern systems gave the writer an "eye-opener" on this

"I had a friend," he told me, "who not long ago asked me for a permit to ride with the engineer of one of our fliers. I told him that, inasmuch as the train was out-bound, it was out of my jurisdiction, but that I would get one for him. I fully expected to be able to do so

"Did I get it? I did not! And I had to explain to my friend that upon investigation I had as much influence in the premises as he had, or none at all.

"No, they're drawing the reins closer than ever on that little detail. Their contention is just, too; they say that, in these days of high speed and stern adhesion to schedule, the engineer has all he can take care of.

Saves Conversational Wear and Tear.

"They add that anybody riding with him is bound to try to talk with him. And he's not paid to talk; he's paid to run that loaded train safely to its destination.

"And the officers, in excluding everybody from the cab except the engineer and the fireman, make it easier for him to execute his task."

From other sources it was learned that to-day the officials of most of the big transcontinental systems are themselves first in observing the letter and spirit of this rule. Riding by officials in engine cabs is not nearly so general as it was only a decade ago.

Now it is done, even by the presidents of railroads, only in urgent necessity, and what talking there is is confined to the brief pauses at stations.

"You'd be surprised to find how the rules that have been evoluting say for the past twenty years have 'jacked up' the pace in the service," said a veteran of the Pennsylvania. "This is particularly true in the freight-service, for now, what with the rules and the running-schedule, there is absolutely no time for dawdling.

"When you come to think of it, they used to take four and six times the intervals for shifting cars a quarter-century ago than they do now. Now, of course, the rules prohibit them from wasting unnecessary time.

System Speeds Up Running-Time.

"Take in the 80's: A freight-conductor who would fool around a crossing the amount of time they all did then would be fired forthwith to-day. Why, freight that in the 80's would take from three to four weeks to get through from Chicago now slides through in two.

"It's all in the perfecting of what we call system: a hastening through all the arteries. It's *pace*."

Investigation shows that, in their demand that their employees should not drink intoxicating liquors when on duty, the railroad heads have been consistent for a century. Among the rules written on paper and pasted up on the walls of the stations even in the early days of railroading there were included warnings of dismissal should those entrusted with the running of trains drink while on duty.

Now the roads are setting their faces more and more, as in other lines of great business, against their employees drinking at all, for the economic reason that they are better employees without it.

A Glance at Present Rules.

To the aspirant for railroad preferment there is now handed a thick little book of instruction detail, in odd contrast to former days when the railroad man read the few regulations off a time-table.

Just to indicate the spirit of the game, let's quote the laconic reminder which starts the Central's list of regulations:

"To enter or remain in the service is an assurance of willingness to obey its rules."

To begin with, all members of the operating-department have first to master a whole alphabet of general rules. Next

there are three pages of general definitions, then 116 train-rules.

Twenty-two pages of rules are printed governing movements by train orders, while another bunch of rules regulates movements by block signals. There are a number of colored cuts covering the "telegraphy of the glim," or the signal system of the lanterns used at night. Then there are specialized regulations covering the work of all classes of helpers.

Grim Humor.

There is a hint of grim humor in such passages as: "If a passenger cannot or will not pay his fare, and has to be ejected by the conductor, it should not be done in such a place or in such a way, or at such unseasonable hours as might ordinarily endanger the health and safety of the person so ejected. The person ejected must not be a child, a person of unsound mind, or in such feeble or helpless condition as to be unable to take care of himself or herself at the point where ejected."

To show the judicious care employed by railroad heads in this matter, the instructions given regarding the ejection of undesirable passengers cover a page.

The rules regulating the procedure of passenger trainmen require his calling out of stations after this fashion: "This train for ——. The next station is ——."

And most passengers will agree that it sometimes sounds about like that.

There are twenty-six rules governing freight conductors to-day, and one of the most important is that they shall see that their trains do not obstruct public crossings more than five minutes. Also, they are informed that they will be held responsible for the violation of local ordinances in these premises. "Tramps or other trespassers must not be allowed to ride," is the laconic manner in which that moot question is answered.

There are eighteen rules for enginemen and motormen. One all-important rule provides that "they must not permit any person to ride on an engine, nor in the vestibule of motors, except those designated to employ stated duties, without a written order from proper authority. They will allow a forward brakeman to ride on the engine when his duties do not require him to be on top of the train."

Men Run Road, Rules Run Men.

Then there are other rules for firemen and helpers, switch-tenders, crossing flagmen, drawbridge operators, telegraph operators and signalmen, master mechanics, road foremen of engines, engine despatchers, and car-inspectors.

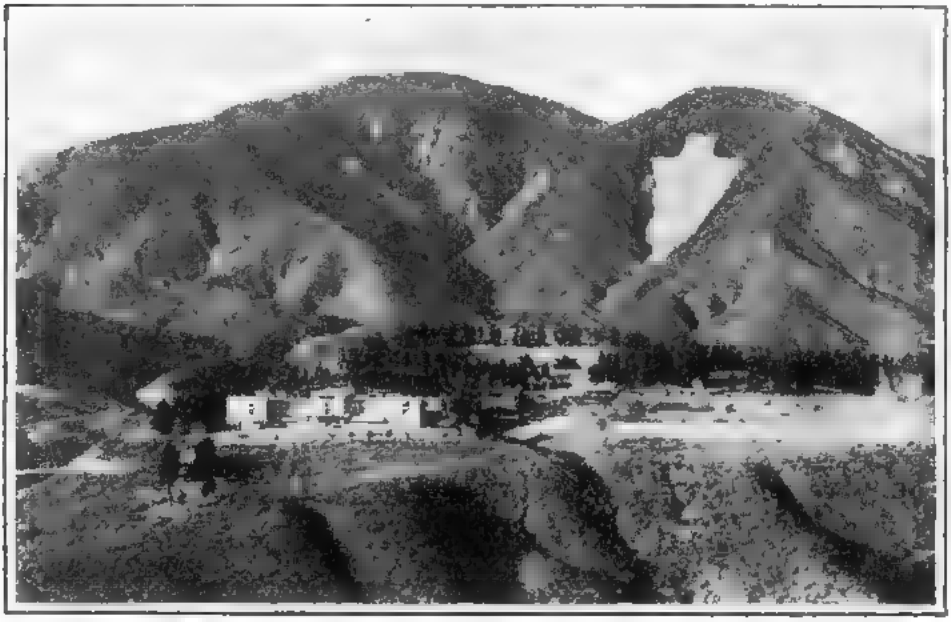
Verily, in these days of grace it takes many men to run a railroad, and many rules to run the men.

The General Counsel says:

DON'T worry because everybody doesn't agree with you. Remember that the vote in the Supreme Court of the United States on the Adamson Law was 5 to 4.

From the Railroad Man's Magazine.

THROUGH THE CAR-WINDOW.



A GREAT ARROW HEAD OF ROCK ON THE SURFACE OF A MOUNTAIN NEAR SAN BERNARDINO, CALIFORNIA, FROM WHICH THE SALT LAKE ROUTE GETS ITS EMBLEM MINERAL SPRINGS NEAR BY, THE MOUNTAIN, AND A HOTEL HAVE BEEN NAMED AFTER THIS FREAK OF NATURE, VISITED BY THOUSANDS EVERY YEAR

Photo by courtesy of the Salt Lake Route

A HUGE arrow-head, fashioned by nature on the face of a mountain in San Bernardino Valley, and said to be one of the most curious geological formations in the country, has given an emblem to a railroad, and a name to a mountain, mineral springs, and a large hotel.

This enormous arrow-head, which attracts thousands of visitors every year, has been adopted as the official trademark of the Los Angeles and Salt Lake Railroad, which is sometimes called the Salt Lake Route. And about its origin there have grown many fanciful legends that have become part of the life of San Bernardino folk

By actual measurement, the arrow-head is 375 feet in length and 449 feet wide, covering an area of seven and one-half acres. Over its surface short, white sage and weeds have grown, and these show up in sharp contrast to the dark-green chaparral and greasewood which surround them

Of the many legends concerning the origin of the famous arrow-head, the most popular is that of the Coahuia Indians. They relate how, harassed by their warlike neighbors who would not let them dwell in quiet, they foregathered one night to invoke the God of Peace to direct them to another home where they could live undisturbed. After elaborate ceremonies and various incantations, they started out in the firm belief that the God of Peace would watch over them

They were not disappointed, for on the first moonless night there appeared in the heavens a huge, blazing arrow, flying westward until it struck the side of the mountain. Here the shaft was consumed in flames, but the head embedded itself clear cut in the mountainside. The Coahuias resumed their journey, and soon reached the promised land.

"HURRY-UP" BILL—ENGINEER.

BY CHARLES WESLEY SANDERS,

Author of "Blow for Blow," "Mr. Tom Hill Assists," "On the Wings of a Warning," "Sleuth 'Morse' Plugs a Circuit," etc.

A RAILROAD MYSTERY NOVEL COMPLETE.

CHAPTER I.

"HURRY-UP" PAYS THE PRICE.

"HURRY-UP" BILL BRONSON stepped briskly into the yard-telegraph office out of the driving rain. As usual Bronson was in a hurry. He was never other than that. Delays made him impatient; sometimes they infuriated him.

He wanted his orders the minute he appeared at the window. He liked to shove his stylus across the flimsy, listen inattentively while the operator droned the orders, and then dash for his waiting cab, the flimsies already in his jumper pocket.

His impatience gained him many precious minutes, for he was a big man with an acid and a harsh tongue. Operators, a little afraid of him, generally gave him better service than they gave to other engineers. The despatchers, escaping his tongue-lashings because they were remote from him and because of their authority, had a feeling akin to that of a long-distance liking for him.

Bronson got his trains over the road. If he told a despatcher he could make the time, he made it unless he was laid out by accident. Because of all this he bore the sobriquet "Hurry-Up" Bronson.

He was not less in a hurry to-night than he usually was. He put his arms on the window ledge and leaned his head through the window.

"What you got?" he demanded of Nicholson, the yard operator.

Nicholson was first in line for a copier job up in the despatcher's office. He felt the weight of his coming authority, for some day he would be running trains. He was a big man himself, and he was one of the few pounders of brass who were not afraid of Hurry-Up.

"Have something for you in a minute," he drawled.

"In a minute!" Bronson lamented. "Can't you give it to me now? I want to make Idlewild for Seven. If I go in at Quincy, I'll lose a good half-hour and maybe more."

"In a minute," Nicholson repeated.

"What is it?" Bronson demanded, a glint coming to his steel-blue eyes.

Nicholson picked up a book of flimsy and read with maddening deliberation

> "Number Forty-Eight will wait at Idlewild till eight twenty-five and at Holbrook till eight fifty-five and at Seymour till nine-fifteen for 1st and 2d Number Forty-Nine"

"For the love of Pete!" Bronson said, as Nicholson tossed the book back on the table. "What is he trying to do? I can be at Idlewild at eight-ten, clear for Seven, and go to Holbrook by eight-thirty. Tell him"

"Nothing doing," said Nicholson. "He let first Forty-Eight go on those orders. You don't expect him to let you by the first fellow, do you?"

"He might at that," Bronson said. "He

knows I'm on this second one, doesn't he?"

"I expect he does," Nicholson answered.

He turned in his chair and looked at the irate engineer.

"Those Forty-Niners are the fastest kind of fast freight," he added. "They got a schedule clear through to Chi. He even gave 'em some time on Six."

"What does he think I'm hauling?" Bronson complained. "Solid train of beef— Well, gimme the order."

"Oh, I've got to repeat it," Nicholson said. "He didn't expect more than one Forty-Eight when he put out that order. Told me to copy three. I had to make extra copies for you fellows.

"He's piled up. No chance to repeat it yet. What's your hurry anyhow? You'll never make Idlewild for Seven. You got all the time you want."

With a groan of disgust Hurry-Up went over to the bench against the wall and sat down. He snatched the glove from his left hand, twisted it with its fellow that he had been holding, and snapped the pair down beside him. Then he took off his cap and ran his hand through his hair.

His was a rough-hewn face, not the face of a handsome man, but the face of a strong one. His black hair, cut very short, twisted close to his scalp so that it defied brush and comb. His eyebrows were black and they almost met between his eyes.

His cheek and chin were blue-black where the razor had lately removed his beard. His forehead was broad and his cheeks stood well away from his ample nose.

His big mouth had a habit of lifting at the left side, and that trick, with his steel-blue eyes, gave him a contemptuous air.

His chin spoke of dogged power. It was heavy. There was a cleft in it like a scar. He was six feet tall and weighed a hundred and ninety pounds.

He was a man to whom weakness, softness, or even kindness made little appeal. His gifts of strength, backed up by an intelligent brain, well-trained for the work he had to do, made his tasks easy for him.

He had no use for men less splendidly endowed. That is, he had no use for them, if he thought much about them. Usually he did not think much about them.

Old Crawley, the conductor, came in out of the black wet. Old Crawley was as patient as Hurry-Up was impatient. He had run many trains in his time, and he knew it was no good to kick against the pricks.

He was not interested in delays which he himself did not occasion. But he knew Hurry-Up's habits of mind. He was aware that Hurry-Up was fuming now, for Hurry-Up had said he wanted to go to Idlewild for Seven.

"What's the matter, Bill?" Crawley said. "Got us tied up?"

"Laying us out here for some cussed fast freight for Chi," Bronson answered. "I guess he thinks this beef is due in New York some time next year."

"Well, we've got to stand for it," Crawley said, and he placed his spare body in front of the big stove.

In the telegraph office Nicholson's call sounded. Like many engineers and trainmen Hurry-Up could pick out a little Morse now and then. He understood the call and he hastened over to his post at the window.

Nicholson answered the call and began to repeat the order. When he got his "complete" he came leisurely over to the window.

Hurry-Up tore the flimsy as he spread his signature on it. Crawley signed carefully. Before Nicholson had finished reading, Hurry-Up had his hand on the knob.

"I can make Idlewild by eight-fifteen now," he said. "I'll wheel 'em over there, Crawley. Maybe he'll change that. Seven is on time. We can just about clear her."

"All right," Crawley said.

Hurry-Up ran out into the rain and got aboard his engine.

"What's the delay?" the fireman asked. "We can't make Idlewild for Seven, can we?"

"I'll do it or bust a flue," Hurry-Up answered. "A couple of Forty-Nines have got time on us—Idlewild, Holbrook and Seymour."

The fireman made no comment. When Hurry-Up was in an especial hurry, he sometimes did not show his orders to his fireman. The fireman had to content himself with this brief synopsis of what they had to do.

Hurry-Up got under way slowly. His train was heavy and the track was slippery. But his sand finally got him going, and then he called for all his engine had.

His impatience was now displaced by a kind of fierce eagerness. Hurry-Up might lose his temper over delays, but he never lost his fighting spirit. He was as determined to make Idlewild for Seven now as if the despatcher had let him slip out into the night without an order.

If he could make Quincy in good shape, he'd get over to Idlewild all right. There the despatcher surely would change the order when he saw how Hurry-Up was "wheeling them."

He came to Quincy with twenty-five minutes to make Idlewild for Seven. He figured he could clear the fast passenger easily by five minutes.

He sped past the white block at Quincy, and went roaring through the cut without diminishing his speed. Ahead of him lay a straightaway course.

"It's a cinch," he told himself.

He was in his glory now. He was "hurrying up" in a way to satisfy even his eager soul. The heavy train, with its gathered momentum, was running well. His fireman was a genius of the scoop. The fire was burning as clear as a gas grate.

He cleared at Idlewild at eight-sixteen. In four minutes the big passenger-train, with its dark mail cars and its lighted Pullmans, sped by on the main. Its tail lights were still in sight as Hurry-Up entered the telegraph office.

"Ask Williams if he can't let me go over to Holbrook for that Forty-Nine," he said. "I can get over there in no time. Everything working like a clock."

The operator repeated the request. At the despatcher's answer he shook his head.

"First Forty-Nine is coming into Holbrook now," he said. "The second one won't make there. It 'll let you by at Seymour in good shape, though."

"Well, we'll be here eight or nine minutes after the first one gets by," Hurry-Up said. "Ask him if he can't bust the time the second one has on us here. I'd like to get over to Holbrook some time tonight."

"Nothing doing," the operator said after he had got an answer to that.

The left corner of Hurry-Up's mouth lifted a little more than usual. His steel-blue eyes glinted.

"Tell the despatcher he can figure me as loose as he wants to for the rest of the trip," he exploded. "I'm not going to break my neck if he doesn't want me to get over the road."

He went back to his engine and sat in the cab till 1st No. 49 went by. Then he pulled out slowly, partly because he believed he did not care whether he made time or not, and partly because of the slippery rails.

But as soon as he was under way that mood passed. His desire to make time was so ingrained in him that he proceeded to try to make it almost unconsciously.

As it was past eight fifty-five when he arrived at Holbrook he did not have to stop. The run from Holbrook to Seymour was brief—ten minutes at most the way his train was moving.

He settled himself to make up what time he could—and in so doing he forgot that he was to wait at Seymour till nine-fifteen for the second section of No. 49

It was eight minutes past nine when the lights of the Seymour block came into view. The light showed white. Hurry-Up's engine thundered past the west switch, past the station, and past the east switch. The heavy train sped out.

In the mind of the fireman, sitting on his box across from Hurry-Up, something dimly stirred. At first he could make nothing tangible of it. He only knew that it was something which disquieted him. The train reeled off a mile. Then the fireman remembered:

"A couple of Forty-Nines have time on us—Idlewild, Holbrook and Seymour."

He slipped down from his box and leaped across to Hurry-Up. He put his hand on the engineer's arm. But Hurry-Up did not look down at him. A hundred yards away from him Hurry-Up had seen the headlight of the 2d No. 49, as the train came round a curve. He shut off and slammed on his emergency air.

He was young and he had never been in the presence of disaster as imminent as this before. He had that terrible instant in which he realized that he had committed the enormous crime of forgetting an order.

It flashed across him, too, that he could do nothing more than he had done except to let his whistle shriek a warning.

The sound shattered the night air, and it was answered almost instantly by a shriek from the Forty-Nine's engine. Then Hurry-Up looked down into the white face of his fireman. It was many days before he escaped the set look of horror in the fireman's eyes.

"Jump, you fool," Hurry-Up said. "We're into them."

They went out opposite sides of the gangway. Hurry-Up landed on the wet gravel on his feet and plunged forward. In a moment there was the sound of rending metal and tearing wood.

It seemed to Hurry-Up that the sound of that would never cease. But at last it did cease and he got to his feet and went forward to the locked engines. He had his moment of gratitude when he found that the other engine crew had also jumped to safety.

There was much to do, and Hurry-Up did his share. He went home on the relief train.

He knew that he had automatically lost his job when the two engines struck, but he went to see the superintendent to have the formality of his dismissal over with.

The superintendent was genuinely sorry.

"It's not much I can do for you, Bronson," he said. "I'll give you the best letter I can, though."

Hurry-Up took the letter and went slowly down the stairs. He was not worried for himself. He guessed he could get along. But there was another for him to worry about.

He debated a while what he should do. Then he decided he would go where she was.

Hurry-Up was not evasive. He believed a man "should stand the gaff" if he derserved it. It was best to face her, to tell her everything, so that she would be prepared for any distorted story which might come to her.

The next evening, his affairs put in order, he sat hunched down in the seat of a smoker, munching a cigar. There was an odd, subdued look in his eyes. Defiance seemed to have died out of them.

For the first time in his life, Hurry-Up Bronson appeared to be facing the world with a questioning air.

CHAPTER II.

JUSTICE OF THE MAN REFORMED.

THE road from which Bronson had been discharged came into a big Ohio city from the west and stretched away into the east. Running south from it was a road which carried the products of West Virginia and Ohio coal-mines.

It was something of a come-down for Bronson to seek a job on a road like this after having spent the years of his railroad life on a trunk line, but he figured that he could get a job more easily here than on a road where rules were stricter.

It was seven o'clock the next morning when he stepped down from his train at the edge of the city. A street-car carried

him to the yards of the north and south railroad. He stood for a moment at the top of the hill, looking down at them as they lay bathed in the summer sunlight.

There was a long, rambling building used as a passenger and freight station and depot, and beyond that a square, two-storied structure which, Bronson knew, housed the offices of the superintendent and the despatchers. There were long lines of coal-cars on storage-tracks, and a switch-engine was busy among them.

Bronson had a little feeling of depression as he gazed. The buildings needed paint. The switch-engine was an old-timer and wheezy.

About the yards there was a general air of neglect. It was all quite different from the spick-and-span yards to which Bronson had been accustomed.

"Well," he said, as he turned away, "it 'll do for a starter—if they'll give me a job."

He had his breakfast and then found a boarding-house on a slatternly side-street. The house was conducted by an aged woman who complained about her hard luck as she showed Bronson the room.

He paid a week's rent in advance. When the woman had left, he threw up a window and sat beside it, smoking, till a quarter to twelve. Then he went down to the street.

A few minutes past twelve he saw a girl come out of the office building and start up the hill. Despite the incline, she walked rapidly. Bronson could feel his pulse pounding in his temples as she neared him.

Her head was bent, and she did not see him till she was quite close to him. Then she looked up.

She seemed to have a good deal of composure, for she did not start or exclaim at sight of him. Her brown eyes lighted up swiftly in a way that thrilled the big engineer, and she smiled faintly.

"Hello, Hazel," he said.

"Hello," she rejoined, and she advanced to him and held out her hand

He did not at once let her hand go, and she searched his eyes, as if she sought to find there a message which his lips had not yet given her. He seemed to divine her feeling.

"Oh, I'm all right that way," he said. 'I haven't gambled in three months. Haven't touched a card. Don't even want to"

"I'm glad," she said simply. "Has it been hard?"

"At first it was," he answered. "Lately I haven't thought about it."

"That's fine," she said. "And three months of your year have gone."

"Yes, dear," he said gently. "Three months. But in the remainder of the year I've got a lot to do. I'm rather up against it just now."

"Nothing matters," she said. "But tell me."

"I thought you'd take lunch with me," he said. "Then we can talk."

"I have only about fifty minutes left," she said. "We'll have to go to some place near by."

"I know a clean little place two blocks from here," he said.

Service was quick in the little restaurant, and their simple meal was soon disposed of.

"Now," she said, when the table had been cleared

"I got 'em together night before last, Hazel," he said

"Oh," she whispered.

She fixed her eyes on his face, and into them he saw a hunted look slowly creep It was a look which he had often seen there in his gambling days

He had never lied to her about his gambling. She had appreciated his frankness, but it had never eased her pain. That was why, three months before, she had put two hundred miles between them.

She had taken what was to him a queer view of their situation. He had had the notion which the strongest of men sometimes have that she should help him to curb his weakness. But she had said that that was his fight.

She held that he must work out his own salvation. If he could not do it alone, with her away from him, she believed he could never do it. If he did do it in that way, she felt that he would be forever safe.

So she had left her stenographer's job in the superintendent's office and had come to the city. A brief note from her—the only one he received—had informed Bronson that she had procured a similar place in the office of the superintendent of the other road.

Bronson now saw that look of dismay come into her eyes. He read its meaning as clearly as if she had accused him verbally. But he only smiled at her reassuringly.

"Don't look like that, honey," he said. "I swear to you I've been as straight as a string. I don't know how I happened to forget an order, but you're railroad woman enough to understand that the best of them will do it sometimes.

"The despatcher was laying me out and I was fidgety. I clean forgot a Second Forty-Nine."

"You're sure you hadn't been—hadn't missed your sleep the day before?"

"I am sure," he said.

Slowly that look died out of her eyes and another of deep content came to take its place. An unaccustomed lump came into Bronson's throat. He had known that he was hurting the woman he loved, but he had not known how terribly he was hurting her.

"My little girl!" he whispered.

Her ready color crept up into her face. Her eyes shone.

"If only you knew how happy that makes me!" she said.

"Well," he returned, "you don't seem to realize that I'm a man without a job. Do you suppose there's an opening on this road?"

"They need engineers badly," she said. "Business is very heavy. You had better see Mr. Russell this afternoon."

"I'll have to give him some sort of story," he said. "I don't know just what it will be. I can't tell him I got 'em together."

"Yes, you can," she said. "You can tell him the truth."

"My dear," he smiled, "don't you know that getting them together is the unforgivable sin?"

"I understand," she agreed. "But Mr. Russell is different than most superintendents. I think he studies men more carefully than most men. He is young and ambitious. I believe he would put you on if you were very frank with him."

"Well, I'd like to be honest about it," Bronson said. "But if he does give me a job, he's a wonder.

"We'd better be getting back. Your time is up. I'll drop in and see Russell in about an hour."

At the top of the hill she paused and looked up at Bronson.

"My brother is here," she said slowly. "He is working the third trick at Amsterdam, the first station south of here. He—I think he is doing better than he was. If you meet him, I hope you will be gentle with him."

Bronson fastened his keen eyes on her face. In the dark places in Bronson's past Hazel's brother had been a conspicuous figure.

Before Bronson had met the girl he had known the brother as a "steerer" for a gambling-room which Bronson frequented. The gambling-room had been run by a character nicknamed Tri-State Luke.

Luke had had an uncanny influence over the boy. The gambler had been a dope-fiend, and there had been times when Bronson had suspected that the boy was addicted to the use of the drug. Previously he had been an operator on the road—a good one considering his years—but he had been discharged for sleeping on duty.

When Bronson had met Hazel, he had learned that the boy, in his meager days, had been borrowing from her. Bronson had said nothing to the girl, but he had forced the boy to leave town.

Himself a gambler, Hurry-Up had felt

no pity for one weaker than he was. He had had no word of the boy in the intervening time. Now he had turned up again. In the righteousness he felt in his own reformation, Bronson had no mercy for the boy.

"Is he borrowing money from you?" he demanded.

"No; he always seems to have plenty of money."

"Too much?"

Her eyes were troubled as she raised them to Bronson's face.

"He seems to have a good deal," she answered.

"What does he do with his evenings?"

"He goes away after supper. I don't know where he goes. But he always reports for duty on time."

"I'll see him as soon as I get settled," Bronson said. "If he's up to anything he'll have to stop it. I won't stand for it."

"Won't you try to help him?" she pleaded. "He's young, you know, and he isn't really bad. He thinks a great deal of me and my sister."

"Your sister?" Bronson asked. "I didn't know you had a sister."

"Why, yes. I live with her. Her husband is the company detective. Of course you didn't know, since I had not written."

"No," he said. "You hadn't written. It's seemed a long time, Hazel."

Again she searched his face as she had searched it many times in the past. Her eyes were suddenly very dark with longing.

"There's no danger you'll fail, is there?" she asked.

"None in the world," he said.

"I must be going," she said. "I'm late now. You'll see Mr. Russell this afternoon?"

He nodded and she turned away. As she disappeared into the square building, she turned to look back at him He waved his hand

An hour later he entered the outer room of the superintendent's office. Hazel sat at a typewriter. As he came in, she got up and smiled at him.

"You wished to see Mr. Russell?" she asked.

Her light-heartedness was one of her chief charms for Bronson. Except with her he was, as he said, as hard as nails. He smiled now.

"If you please," he said.

She entered Russell's office and came back in a moment.

"Mr. Russell will see you," she announced with great gravity.

Bronson entered Russell's office and closed the door behind him. Russell looked up. He was a near-sighted, sandy-haired young man of slight figure. But back of his big glasses Bronson saw that his eyes were keen.

"Yes, sir?" he said with a rising inflection.

"Need an engineer?" Bronson asked.

Russell's eyes flashed over him from feet to head. His glance rested on Bronson's face.

"Sit down," he ordered.

Bronson dropped into a chair.

"Where'd you work last?" Russell asked.

Bronson named the road.

"How long had you been running?"

"Four years."

"Quit?"

"Fired."

"Why?"

"Got 'em together."

Russell sat perfectly motionless, staring into Bronson's eyes. Bronson might have resented the scrutiny, but he felt as if he were something inanimate which Russell was coming to a decision about. Russell's regard was coldly impersonal.

"Got a letter?" Russell asked after a while.

Bronson gave him the letter from his former superintendent. Russell ran through it.

"That was your first, last, and only wreck?" he asked.

"Yes."

Russell suddenly wheeled about to his desk. He picked up a pen and wrote rapidly.

"You'll have to learn the road of course," he said. "Come in day after to-morrow ready to go to work. I need several good engineers like the deuce. I'll have you running before long. Good day."

Bronson went into the outer office. The girl's typewriter clicked on. She did not look up. Bronson smiled to himself and walked over to her. After a hasty glance about the room he put his hand under her chin and lifted her face. Her eyes were shining with mirth.

"You got your job, didn't you?" she asked.

"How did you know?" he asked.

"Because I recommended you to Mr. Russell."

"You did? Well, aren't you breaking your promise to yourself? I thought you were going to leave me severely alone for a year."

Tears leaped to the girl's eyes.

"I can't," she murmured. "It's been so good to see you! Oh, don't—don't fail me. Don't even be tempted."

Bronson dropped his hand to her shoulder.

"Don't worry, little girl," he said. "I won't fail you. I'll make good for you here, and then we'll move on to something better. Thank goodness, I'm going to see you once in a while. It's been mighty lonely."

His voice grew husky on the last words. He was more moved than he had ever known himself to be before. He turned and walked swiftly from the room.

He went down the track to the station and started through the waiting-room of that. As he reached the far door he heard his name called. He turned. An undersized, leathery-faced man of uncertain age was coming toward him with outstretched hand.

"Why, Hurry-Up, what 're you doing here?" he asked.

Hurry-Up did not take the proffered hand. His eyes hardened in a way which the man knew and feared.

"What 're *you* doing here, Tri-State?" Bronson demanded.

Tri-State looked at him with crafty eyes. He had not failed to notice that Bronson had refused his hand.

"Oh, nothin'," he answered.

Bronson was about to press his question when he saw a man saunter up to the waiting-room window on the side near the track and lean against the sill. Bronson recognized him instantly as Harry Baker, Hazel's brother. The appearance of Baker and Tri-State at the same place readily explained what Hazel had said about her brother being in abundant funds.

"Nothing?" Bronson laughed.

He lowered his voice.

"Where's your place, Luke?"

"Oh, you," Luke said. "It's an old red mill about ten miles straight south of town. You get a cab and keep going till you come to the Bridgetown fork. It's just across the bridge from there. To-night?"

"Probably," Bronson said. "Say," he added, "there's young Baker over there. Don't tell him you've seen me. If he's working for you, he might be scared. We had a run-in back home, you know, but that's all over."

"All right," Luke said.

He went into the waiting-room and Bronson climbed the hill. Now that Luke could not see him, Bronson's anger boiled up in him. He declared to himself that he would fix young Baker's clock for him.

Baker needn't think Bronson was going to permit Hazel's brother to be mixed up with a man like Luke. Hurry-Up was prepared to mete out the sternest justice that exists—the justice of a man reformed.

CHAPTER III.

HURRY-UP MAKES AN ENEMY.

SHORTLY after sunset a taxicab set him down at the Bridgetown fork. He paid the driver and the cab turned about and sped away. Bronson stood looking about him.

In front of him was a tumble-down

bridge and beyond that he could see the old mill, bulking its dilapidated shape in the starlight. The quiet of the country was all about the mill. It seemed deserted. There was no light in it.

Bronson crossed the bridge and walked over rotted sawdust till he came to a heavy door set into one side of the building. This door, unlike the rest of the building, seemed to be new. Bronson perceived that, with his usual caution and cunning, Luke had had a new door placed where an ancient, insecure one had been.

After a moment of hesitation Bronson rapped three times on the door. For a while there was no answer. He repeated the raps.

Then suddenly there was the sound of bolts being withdrawn. The door was opened a foot. Hurry-Up had expected a glimmer of light from within. There was none.

He felt that some one was standing back there in the darkness, but he could make out no one. He waited, aware that whoever was peering out at him could recognize him in the dim night-light.

"All right," said Luke's voice. "Step inside."

Bronson obeyed. Luke closed the door. Bronson found himself in utter darkness. He did not hear Luke move away from him, but in a few seconds the darkness at the far side of the room was split by a thin shaft of light from an electric pocket lamp.

At the end of the shaft Bronson saw a pair of heavy black curtains. Luke drew these apart.

"Come on, Hurry-Up," the gambler said.

As Bronson advanced to the drawn curtains, he looked into a gambling-room beyond them. There was the usual paraphernalia. A roulette wheel, two poker-tables, and a faro bank were ready for play. Bronson stepped into the room behind Luke.

Because of the early hour, there was no one in the room. Luke motioned Bronson to a chair.

"Drink, smoke, Hurry-Up?" he asked.

Bronson shook his head.

"How long you been here, Tri-State?" he asked.

"Two months. I had everything done to me in our village. Had to move on to other pastures. They're stricter than the dickens in this town, but they haven't got wised up to me yet. I'll make a killing here before I'm through. Got some good ones on the string."

"Young Baker is steering for you evenings before he goes to work?"

Luke shot a swift look of suspicion at the engineer.

"Yeh," he at length admitted. "Look here, Hurry-Up, you're not going to start anything with him, are you? I told him you said everything was all right with you. He seemed mighty relieved. He's afraid of you, Hurry-Up."

"I don't care what he does," Bronson answered indifferently.

"That's good," Luke said. "Now about you an' me, Hurry-Up. It 'll be fifty-fifty between us every time you sit in, eh?"

"All right," Bronson said.

"Gee, I'm glad you showed up here!" Luke said enthusiastically. "Best little dealer east of the Mississippi, and I can sure use you in my business. I got to work fast. I expect a couple of live ones in to-night. You wait till they get started and then sit in."

They sat in silence. Luke brooded with down-cast eyes. Bronson listened for the signal-rap on the outer door.

When it came he walked over to the roulette wheel and played with it idly. Luke went to the door. In a moment he was back again. Bronson heard him speak to some one who accompanied him, but Bronson did not look around.

"Oh, Mr. Gray," Luke said, "shake hands with Mr. Treat."

Bronson turned about. He saw a man almost as big as himself, but a man whose body had been built grotesquely. He would have had wide shoulders if he had not let them slump forward so long that

they seemed now almost to overlap his chest.

His arms were unnaturally long, and they swung in front of him instead of at his sides. His face was lined and there was a long red scar on one of his cheeks. Tobacco-juice stained his thin lips.

In spite of all this two things impressed themselves on Bronson: The man was very well dressed in expensive clothing, showing taste. His eyes were as bright as if they had been charged with electricity, denoting intelligence. Bronson wondered if some of his uncouthness was a pose.

The two men shook hands. Mr. Treat's fingers closed about Bronson's hand in a firm, steady pressure. He looked into Bronson's eyes. Then he dropped the hand suddenly, withdrew his gaze, and walked over to the poker-table.

"How soon 'll we get a game, Luke?" he asked.

"Very soon," Luke answered.

"Mr. Treat" sat down and began to deal dummy hands to imaginary players. He examined the hands as intently as if they were really in play.

Luke looked at Bronson and jerked his head back. He moved over to the far side of the room and Bronson followed him.

"I don't quite get that guy," Luke said. "He's clever enough in a way, but he's an awful dub in a game. Crooked as a dog's hind leg. He can fool some of the easy ones, but of course he'll be nuts for you. Get into him. He's got kale in bunches."

"Who is he?" Bronson asked.

"I don't know. Young Baker brought him here one night. Baker said the guy found out somehow that he was steering and made him bring him here. Baker wouldn't tell me who he was—said he didn't know.

"I've been kind of suspicious of him. Thought at first he might be a bull. But I guess not. He'll never have a better chance to pinch me than he's had for the last two months.

"He likes the game. That's the way I figure it. I don't know his business."

Fifteen minutes later, there was a rap on the outside door again, and Baker, followed by two men, entered. Baker shot a quick glance at Bronson. For a moment Bronson held the boy's eyes with his own.

Over Bronson's face had come the look which had made him a famous poker-player. To the boy it was inscrutable. He had Luke's word for it that Bronson's enmity had died, but now he was doubtful. And he was afraid of Bronson. He looked away.

Luke introduced the two men under fictitious names.

"Like a little game, mebbe?" Luke asked.

"That's what we came for," the older of the men said. "We've had a standing invitation for a month from the youngster, but never got around to it till to-night. Don't mind a little flyer now and then on the green cloth. Any limit?"

"Where the stars shine dimmest the limit is," Luke laughed.

"Good enough. Don't like a piker's game. Well, let's start."

Mr. Treat was already at the table. The boy sat down next to him. The two other men sat across from them. Luke looked at Bronson.

"Care to play to-night, Mr. Gray?" he asked carelessly.

"After a bit," Bronson answered. "I'll whirl the roly-poly for a while if you like."

The men started the poker game, and Luke and Bronson walked over to the roulette wheel. Bronson bought checks, for which he did not pay. Luke whirled the wheel. They played for half an hour. Luke kept his dark, nervous eyes on the poker-table.

"That guy Treat is cleaning them up," he said. "You better get in there. You can cop everything. If he can get the money on his rough play, it will be a cinch for you. Go on."

Bronson put his last check on a number

and turned away. He sauntered over to the poker-table. Young Baker was just buying another stack of checks.

"Better sit in, Mr. Gray," Treat said.

Bronson looked down at him. On the instant of his speaking Bronson had felt the old desire begin to sweep through him.

It was one thing to remain away from gambling-rooms. It was a vastly different thing to watch men engaged in the sport which had once been a passion with him.

His usually cold eyes grew hot. He wavered.

And then he thought of the brave girl who had put her faith in him—the girl he had assured that afternoon that he was done with all forms of gambling. The light died out of his eyes.

"You're doing pretty well, Mr. Treat," he said. "Let your luck run for a while. I might change it."

"Think so?" Treat sneered. "I'll take a chance."

Bronson felt his face flush. He wanted then to play for another reason. He was a man who stood taunts poorly. He knew that if he sat in he could make Treat's stack melt like so much ice in hot water.

But he put that temptation away also. If he played, the dawn would find him still at the table providing the others remained. The thing he had come here to do would remain undone. And he felt that it was an important thing to do.

"I merely meant that the run of the cards would be different," he explained to Treat.

"Oh," said Treat, contempt still in his voice. "Well, there's a seat here for you any time you'd like a little of this. It ain't a piker's game."

The taunt stung Hurry-Up anew. But he held his temper back. And as he did so a soothing peace stole over him. He was at last victor over himself.

He had but to pull out a chair and sit down. But he wasn't going to do it. For the first time in his adult life he was a spectator at a poker game instead of being a participant in it.

The play went on. Treat continued to win. Bronson heard Luke move across the room, making unnecessary noise. Luke coughed. Bronson did not look at him. He was staring down at the green table.

After a moment Luke came over and stood at his elbow. Luke nudged him. Still Bronson did not raise his head.

"Four-handed game is kind of slow, ain't it, fellows?" Luke asked.

"I'll say it is," said Treat. "The house can sit in if it wants to."

"All right," Luke said.

He sat down and from his position he could now look into Bronson's eyes.

"How about you, Mr. Gray?" he asked.

Bronson did not answer him. He had turned his attention to Baker. Baker had lost his last chip, and he was drawing a roll of bills from his pocket.

Bronson passed Luke and stood at Baker's shoulder. As Baker started to count out his money, Bronson laid a heavy hand on his shoulder. Baker looked up apprehensively. Play stopped.

"That will do for you, son," Bronson said quietly.

"What do you mean?" Baker asked in a low voice.

"You've played enough."

"I'm due to win," Baker argued.

"Get up."

Bronson's voice had hardened. The boy saw his ready anger begin to flash in his eyes. With a hand that trembled, Baker put his money into his pocket and pushed back his chair. Luke sprang to his feet.

"What's this play, Hurry-Up?" he demanded.

"I want this boy to quit your gambling-shop," Bronson answered steadily.

"You going to drive him away again?"

"That's my business."

Baker had got to his feet. Bronson half turned away.

"Come along," he ordered.

"Wait a minute."

The man called Treat spoke. Bronson wheeled back to the table. There had

been an insulting drawl in Treat's voice. He was on his feet now. His bright eyes met Bronson's. He began to curse steadily.

"And you think you can come here and bust up a game I'm sitting in?" he concluded. "Not on your life! Where do you get that stuff? Leave the boy alone."

"If I don't?" Bronson questioned.

Treat's teeth clicked together.

"If you don't?" he snarled.

He came around the end of the table. His hand was groping at his hip pocket under his coat.

As he neared Bronson, the latter stepped forward unexpectedly. His right fist shot out and caught Treat on the side of the jaw. Treat collapsed across the table and lay there, scattering the piled-up chips as he fell.

Bronson seized the boy by the arm and hurried him across the room. At the curtains he paused. The two strangers were regarding him with wide-open eyes. They were too astonished to speak.

Luke still stood by the table. His face was twisted with hate.

"So long, Luke," Bronson laughed harshly.

He swept the curtains aside and ran across the outer room, drawing the boy with him. He shot the bolts of the heavy door, passed through it with Baker, and stood outside.

"We'll have to walk to town," he said. "Come on."

Baker obeyed without a show of resistance. Neither of them spoke till the mill was two miles behind them. Then Bronson slackened his pace.

"What're you going to do to me?" Baker asked.

"Put you on the midnight train for the West," Bronson answered.

"But I've got a job here," Baker protested.

"I don't care if you've got seven jobs," Bronson returned. "You're going as far away from here as you can get and not bother your sister any more. You can easily get another job

"I'd advise you to settle down and work at your trade. You're a good operator. Leave gambling alone and you'll be all right."

It was too dark for Bronson to see the wild look of hatred and rage that flared up in the boy's eyes.

"All right," he said bitterly. "I'll go. If I don't you'll hound me. You won't give me a chance. I been working right along since I been here. I've tried to be decent."

"Yes," Bronson scoffed. "You've been decent by steering for a dope-fiend like Tri-State, haven't you?"

"I had to do it," Baker said. "I didn't do it because I wanted to. It's only a few months since you quit dealing crooked cards for Luke yourself."

"Shut up," Bronson commanded.

Baker was silent while they covered another mile. Then he broke out suddenly, his voice ringing with passion:

"You'd better look out for yourself, Hurry-Up Bronson. You can't slug a man like Crocker and get away with it."

"Crocker?" Bronson asked.

"Yes," the boy cried. "Crocker! My brother-in-law, the company's detective. He'll kill you for what you've done to him and me to-night."

CHAPTER IV.

TROUBLE AT AMSTERDAM.

BRONSON had come from his first round trip to learn the road and was ready to leave for home. One of the round-house men hailed him.

"The super wants you to take a couple of us up to his office on your engine," the man said.

"My engine?" he said. "It's Braley's engine. He's around somewhere."

"You're Bronson, ain't you?" the man asked. "He said he wanted Bronson."

"I'm Bronson all right," Bronson answered. "I'll go if he wants me. Can you keep her hot?"

"Sure I can," the man answered.

He called two other men and the four climbed into the engine cab. Bronson, wondering, ran down to the old square building. Dusk had just settled down, but Bronson made out Russell standing on the platform as he stopped. Russell swung himself up into the cab, followed by a couple of yardmen.

"There's some trouble over at Amsterdam," Russell said. "I saw you were just in and I had you come down because you look as if you had nerve. That right?"

"I guess I can hold my end," Bronson answered. "What's the trouble?"

"Operator at Amsterdam said an automobile had stopped near the south switch," Russell said. "It looked to him as if they were breaking into a car. He may be wrong of course, but we had a robbery about a month ago like that. It was a set-out car."

"Why," said Bronson, "we set out a car at Amsterdam an hour ago. Had a hot box. Maloney swung us down a quarter of a mile from the south switch."

"That's the way it was before, but Maloney wasn't the conductor," Russell said. "Was the box on fire?"

"Blazing," Bronson replied.

Russell shoved a hand into his coat pocket and slipped a revolver up to Bronson.

"You may need that," he said. "Get over there as soon as you can."

The yards had been left behind and the light engine was rushing through the night. Russell had instructed Amsterdam to set his block against all northbounds, so that they had a clear track.

Bronson pondered. There was something curious about that hot box and the set-out car.

They had stopped for orders a couple of stations south of Amsterdam. Bronson had hopped off at the station as the train pulled down. He had filled the water-jug at the station pump and was on his way back to the engine.

Mechanically he had looked back over the train. Six or seven cars beyond the station he had seen Maloney, the conductor, stop beside the car whose journal had later been ablaze.

He had paused to watch. He had seen the conductor lift up the lid of the box, poke into it, and pull out a great mass of oily waste. Supposing that Maloney was repacking the box, Bronson had gone on to the cab.

But he knew now that that box had not been repacked. It looked to him as if the conductor had, for some reason or other, planned to let the box go hot. It was very strange.

There was another strange fact. They had cut off behind the car with the hot box, had pulled past the north switch, and backed in with it. On his side Bronson had been looking back for the stop signal. The car had been into clear by half a dozen car-lengths, but still they had not been swung down.

The engine had crept over a road which ran down hill into a wooded country. The road lost itself in forbidding darkness. On the far side of the engine it ran uphill and bent away to the south in another declivity. There were no buildings of any kind in sight. It was the loneliest spot Bronson had seen on the road.

The engine had crept on. Soon the south switch came into sight. The engineer was muttering angrily to himself.

When Bronson judged the car was in the shadows some distance below the road, he saw a flagman swinging them down. He called across to the engineer.

It seemed to Bronson now as if the car had been placed in that particular spot by design. The placing of it thus and the manufactured hot box made it appear as if Maloney might have an interest in the robbery that was being prepetrated.

Bronson looked down at Russell. Russell was staring ahead, looking for the Amsterdam block. Bronson wondered if he ought to communicate his suspicions to Russell.

He swiftly decided that he would not do so. He had enough to do to play his own game. Certainly his stake was big

enough. Anyway Maloney's actions and the robbery might be coincident.

In a moment the block light at Amsterdam showed white a mile away. Bronson eased her off a bit.

"What do you want to do?" he asked Russell.

"Go down there where you set out the car as fast as you can and make a quick stop," Russell said. "If there is anything crooked going on don't hesitate to shoot. I'll nip this business right now if I can."

The engine swept on. It came abreast of the cross-roads which Bronson remembered. Bronson looked out. Then he suddenly shut off and shoved his air to emergency.

Between him and the south switch light he saw three men. They were coming toward him, and each had a box on his shoulder.

Before the engine stopped, it had passed the men. He saw the men drop their burdens and run for the machine.

"There they go!" he yelled to Russell. "Come on!"

He jumped down and Russell and the round-house men followed him. By this time the pedestrians with the boxes had disappeared up the cross-road.

As the pursuers ran they heard the automobile started. When they came to the foot of the road, the machine was climbing the hill.

Russell sped up the road like a hare. Bronson was at his heels. Bronson had always held office men in contempt because they were "pencil pushers," but he had to admire Russell for his speed and his nerve now.

As they ran, they heard a revolver bark from the machine. A bullet whistled by them and droned away behind them. The car had reached the crest of the hill.

Russell stopped and fired three times. But the car disappeared over the rise and was gone. Russell swore softly.

"We'd better get back to my office and phone the surrounding country," he said. "I'll leave the men here to guard the car and put those boxes back. Any one of those boxes is worth a bunch of money; full of the finest kind of merchandise—special car."

Bronson's suspicion of Maloney nagged at his mind. He hated to be a "squealer." Besides he hadn't been immaculate himself. In Luke's poker game he had been guilty of crooked dealing.

He supposed now that that was as bad as stealing, except that nearly everybody else in the game had been crooked. He had merely used the same weapons they had used and had used them a little more skilfully. It was different when a man carried knavery into his business.

He could not convince himself of what he ought to do, but he blurted out as they came back to the engine:

"Mr. Russell, it might pay you to take a look at the box that went hot on that car."

"What do you suspect?" the super asked quickly.

"Well, the car was evidently set out to be robbed. Maybe the box was tampered with."

They went down the siding till they came to the car. Russell pried up the lid of the box. It was empty of waste, save for a little charred bundle.

"Whoever took the waste out left enough to catch fire, didn't he?" Russell mused.

He turned suddenly on Bronson.

"Look here, Bronson," he said, "I rather hired you with my eyes shut. Miss Baker said she had known you back where you both used to live and that you were capable. That influenced me somewhat, but there was something about you that influenced me more. You looked like a strong man, a man with nerve.

"I've done you a good turn. Do me one. Who took the waste out of that box?"

Bronson looked long into the bright eyes behind the big glasses. He was coming to admire the alert little superintendent more and more. He was a live wire. Besides it gave Bronson a feeling

or relief to be arrayed with a law-abiding man. He himself had somewhat mocked at the law in the past. But—he couldn't "squeal."

"Your conductor's the man to ask about that," he said at last.

Russell seemed to take an unexpected satisfaction from that answer. Bronson saw that he had said more than he had intended to say. He perceived that a hint was a good deal to Russell.

"Let's get back to my office," Russell said. "I told the despatcher not to let anything come against us till I gave the word, so it's all right."

They sped back to the yards through the summer night.

"As soon as you get your engine put away come up," Russell ordered.

It was half an hour before Bronson climbed the stairs to the despatchers' room. He passed through that, through Russell's outer office, and knocked on the closed door of Russell's private room.

Russell's voice bade him enter. He opened the door, stepped inside, and stopped dead still. Crocker was sitting across from Russell.

The eyes of the two men met. Bronson's face went hard. There was no expression in it. He had schooled himself to that blankness over many a poker hand. Into Crocker's eyes there leaped a look of abandoned malevolence. Bronson saw his hands go shut hard on the arms of his chair.

"Come in and close the door, Bronson," Russell said.

Bronson complied. He sat down at Russell's left.

"Crocker is our detective," Russell said. "I'm telling him what I know about this robbery, so that he can get busy. I have told him that the box was emptied, so that the journal would run hot. Is there anything else you know, Bronson?"

"Nothing," Bronson said.

"You didn't see anybody take the waste out of the box, did you?" Crocker sneered.

That anger which he had not yet learned to rule flamed up in Bronson's breast. He hated very readily, and he hated Crocker now.

"Don't use that tone to me, Crocker," he said.

"Is that so?" Crocker flared out. "I'd like to know who you are. What 're you doing on this road, anyway? You couldn't hold your last job. You got 'em together."

"I know all about that, Crocker," Russell said. "That's my business."

"I suppose it's your business that this man is a professional gambler—a crooked dealer at that," Crocker said.

Russell looked at Bronson.

"I haven't touched a card in three months," Bronson grated out. "I *was* at a gambling-place at the edge of town the other night. I went there for a purpose. I went there to save a boy from going to the devil if I could."

"And started a rough-house," Crocker broke in.

"Never mind about that," Russell said. "How do you happen to know about it, Mr. Crocker?"

There was an edge on that word "mister." Crocker's jaw dropped.

"I—I just happened in there," he said.

"You'd better happen to stay away from places like that," Russell said.

He turned to Bronson again.

"Are you going to tell me who took the waste out of that box?" he asked.

"No."

Bronson spoke the word in a tone unusually gentle for him. There was no defiance in it.

"Very well," Russell said. "Crocker, go down to Maloney's home and bring him up here."

"Maloney?" Crocker said. "You don't suspect Maloney, do you? He's one of our best men."

"Bring him up here," Russell repeated.

Crocker rose and with another look of hate at Bronson left the room. When he had gone Russell began to speak slowly. He did not look at Bronson.

"Bronson," he said, "I'll tell you why

I gave you a job. It wasn't that Miss Baker told me all about you before you came. Her recommendation would go a long way with me, but it wouldn't be sufficient.

"I hired you because I have a soft place in my heart for men who get 'em together. I got 'em together once myself when I was a kid operator. Forgot an order. I had a hard time for a while. But I've got along pretty well since.

"The same man doesn't usually get 'em together twice. And I've read you pretty well. You're contemptuous, quick to anger, likely to be violent. Miss Baker told me about your ruling passion. She knew, too, somehow, about your visit to the old mill the other night. She told me about that, too.

"Miss Baker"—with a dry smile—"is rather interested in you, Bronson. I think you'll make good on her account now. I need men. You can come along here. You've got a head on your shoulders."

Russell suddenly lifted his head and fixed his bright eyes on Bronson's face.

"I know how you feel about squealing. I don't blame you. But this is serious business. Will you do me a favor?"

"If I can," the astonished Bronson said.

"Crocker will stop at McDavitt's saloon for a drink of whisky on his way to Maloney's. I know Crocker pretty well. To stop at McDavitt's he must go two blocks out of his way. You can arrive at Maloney's house before him if you go down the tracks and up the first cross-road you come to.

"Maloney lives on the corner in a green house sitting well back from the street. You can't miss it. I'd like to have you across the street under the trees when Crocker arrives. Come back and tell me how long Crocker and Maloney talk together before they leave Maloney's."

"I don't see any harm in that," Bronson said.

"You've just about time," said Russell.

Bronson left. Russell drew a pad of clip to him and wrote a brief message. He took it out to the despatchers' room.

"Get that off on the pony wire as soon as you can," he instructed.

The message read:

> T. N. Gorham, General Manager, Hammondsville. Can you lend Fordney to me for a while?

CHAPTER V.

LUKE SHOWS HE'S HEP.

FORTY minutes later Bronson knocked on Russell's door and entered before Russell could invite him to do so. He walked swiftly across to Russell's desk and leaned over the little superintendent.

"Crocker and Maloney talked together at Maloney's front door for ten minutes," Bronson said. "Then Maloney went inside. He came out in a minute with his coat and hat on. I came back by the way I went. They started in the direction Crocker had come from. I suppose they will be here in a few minutes. I'd better go, hadn't I?"

"Yes," Russell assented. "I'll take care of Maloney and Crocker."

"I'd suggest," said Bronson, "that you don't give your hand away. I don't suppose you could prove anything on Maloney yet. I guess they're not through with their business."

"Much obliged," Russell said with his dry smile.

Bronson flushed. He stood looking down at Russell's bent head a moment and then he got himself out of the room.

"That little fellow is mighty keen," he told himself.

Down-stairs he walked rapidly up the track, so that Maloney and Crocker should not see him as they came to Russell's office. He had decided to go to see Hazel. In the new frankness which he had taken as his rule, he wished to tell her just what he had done to her brother.

This was a good opportunity. Crocker would not be home till late. He was not afraid of Crocker, but he thought it just as well to avoid him for a time.

He was a little worried about how Hazel would look at what he had done. She had asked him to be gentle with her brother. He had not been gentle.

But the boy was no good. It would be a waste of time to try to do anything for him or with him.

Bronson knew how strong a man had to be to break the habits which had fastened themselves on young Baker. Baker, he was sure, was not strong enough. It had taken all his own strength to break his own habit.

When he came in sight of the Crocker home, he saw that lights were burning in the front room. The house was more pretentious than Bronson would have expected a railroad detective to be able to afford.

The house showed signs of recent repair, and it had been recently painted. The grounds about it were well kept.

Bronson went up the stone walk and mounted the steps. A rug ran across the porch from the front door and flowed down over the steps. As Bronson mounted them, the sound of his footsteps was deadened.

As he paused before the screen door, searching for the push-button, he heard a woman's voice. Though he could not distinguish the words, he knew Hazel was speaking. She ceased, and Bronson heard a women sobbing softly. Then another voice—a women's stifled, bitter voice, said: "I wish he were dead, the brute."

Bronson turned noiselessly on the rug and tiptoed down the steps. On the sidewalk he stood for a few minutes and then he went up to the door again. As he neared it he coughed. He had no wish to intrude himself on the Crockers' domestic troubles.

There was silence in the house as he rang the bell. Then Hazel came into the hall from a room off it. At sight of him she exclaimed. She opened the door and bade him enter.

In the hall she hesitated a moment and then she led the way to the door through which she had just come. As Bronson followed her through the door, a woman rose at the far side of the room.

The only light in the room was from a shaded lamp, so that Bronson could not readily distinguish the woman's features.

"This is my sister, Mrs. Crocker," Hazel said in a low voice.

She spoke Bronson's name to the woman and she came toward him swiftly. Bronson saw that she was taller than Hazel. Once she must have resembled Hazel a good deal, but suffering and grief had erased the brightness from her face. Her mouth was bitterly grim, and her eyes were hot from deep emotion.

For a moment she stood looking at Bronson and then she advanced till she was standing within a foot of him. Bronson saw then that there was a bruise on one of her cheeks and a slight discoloration beneath one of her eyes.

"What have you done with my brother?" she broke out unexpectedly.

"I?" Bronson stammered, losing his wit before her passion. "Why, I—"

"You drove him away, didn't you?"

"I found him gambling again," Bronson said. "I sent him away. He has caused Hazel enough trouble."

"It was only the other day that you stopped gambling, wasn't it?" Mrs. Crocker asked.

"But I did stop," Bronson said.

"You are a strong man," she said. "Why didn't you help him? If you had tried, you could have shown him that it was possible to quit. But like all strong men you don't use your strength that way."

She looked as if she were about to start crying anew; then she turned suddenly and swept from the room. Bronson stood motionless while he heard her mount the stairs. On the floor above a door was slammed shut.

Bronson turned slowly to Hazel. Hazel, too, looked as if she had been shedding tears. Her eyes were red and she held a crumpled handkerchief in her hand.

"How did you hear about your brother?" he asked.

"He wrote us from Chicago," she answered. "He was there looking for work, but he hadn't found any. He had no clearance from here, you know. It may be difficult for him"

"You think I was cruel?" he asked.

She sighed and was thoughtful, with bent head.

"You didn't mean to be cruel," she answered. "And if you must turn your face against all weakness to save yourself, if you must be hard to keep from being tempted, you did right in sending him away. You went to that gambling-room only to find him, didn't you?"

"Only for that," he answered quietly. "While I was there, I had one moment during which the old lure came back. But I killed it.

"I didn't touch a card. That's the truth. I toyed with the roulette wheel but that was pretence. I'm done with it."

"It infuriated me to see your brother there. He was bound to lose his job—to get into trouble. And then he would be bothering you again. I don't think he has it in him to reform.

"I did what I thought was right. It was something, wasn't it, that I didn't play?"

"It was everything," she said. "It hurts me of course, and it hurts my sister more. She says no one has ever understood my brother. They are a good deal alike. They are both headstrong and impulsive. It made her a little less unhappy to have him here."

"How did she come to marry a man like Crocker?" he asked.

"I don't know. It was one of her impulses."

"He's brutal to her, isn't he?" Bronson asked. "He's been abusing her—physically."

Hazel's eyes went down. She did not look at him. He went round the table and took her hands.

"Hazel," he said, "let me take you and your sister out of this. I can look after both of you. I've got a pretty good job, and I think I'm in Russell's good graces. I'll get your brother back here and do what I can to make a man of him. Why need we wait for a year?"

The girl shook her head and he saw moisture gather on her down-dropped lashes.

"I'd like to," she said in a low tone, "but I mustn't. We've got to live this year as I said we'd live it. All that old desire has got to be dead in you—dead, dead. I'd rather die than be your wife otherwise. If you failed me, we might come to be what my sister and Crocker are to each other."

"Can't you go somewhere else?" he asked. "It isn't safe for you to be where that brute is. I believe he's murderous."

"I must stay with my sister," she said. "You don't understand how close my sister and my brother and I have been to each other. She is older than we are, and there were five years when she supported us. She was very loyal.

"My brother has not forgotten that. She is the one person in the world that he cares about. He would give his life for her. When he came here, he went to work and he gave her his word that he would be a good boy. He seemed to mean it, but I suppose he was not strong enough."

"I am sorry, Hazel," he said. "When you hear from him again, tell him to come back. I'll do what I can for him."

"Thank you, dear," she said. "You had better go now. I must see if I can do anything for Ethel. Mr. Crocker may come home at any time. Good night."

"Good night," he said.

He did not offer to kiss her. He put her hands down gently and left the room.

Hazel stood listening till his footsteps had died away on the sidewalk. Then she went up to her sister's room. She seemed a little tired.

Bronson walked rapidly down the street. He had grown suddenly rather weary. His muscles ached from the unaccustomed use of the scoop. He would probably be called in the morning. He needed rest.

His way took him across the tracks. He came to the station presently, went round on the far side of that to avoid meeting Crocker, if Crooker should leave Russell's office just then, and started up the hill. He was half-way up when he saw a man coming down. Though he could not see the man's face, he knew him from his carriage. It was Tri-State Luke.

Luke stopped with an exclamation when he saw Bronson. Bronson would have kept on. He wondered subconsciously why he had ever associated with a thing like this ignorant cheat. But Luke stopped him.

"I just want a word with you, Hurry-Up," Luke said. "I didn't quite get you on that play last night. You could have got the kid away without starting a rough-house, couldn't you?

"You hurt my business. I had a couple of live ones there, and you scared 'em away. They won't come back.

"Where do you get that stuff? Just because you've quit is no reason why you should put me on the hummer."

"Your friend Crocker riled me," Bronson said. "And you lied to me when you said you didn't know Crocker. He was going to pull a gun. He was responsible for the rough-house."

Luke scanned Bronson's big face with a puzzled expression on his own.

"I don't quite get you, Hurry-Up," he sighed. "You declare yourself out on the best thing that has ever come your way. You must be in love."

"You keep your tongue off that," Bronson grated out. "I'll give you worse than I gave Crocker if you don't."

"You better look out for Crocker," Luke said, his own anger flaring up. "He'll get you if you go monkeying with him."

"Will he?" Bronson flashed out. "He'd better lay off me, I'm telling you. If he doesn't leave me alone, I'll put him into clear and he'll stay there. You know neither you nor he can put anything over on me."

"I didn't know you had a killin' streak in you," Luke sneered.

"I'll keep up my end," Bronson said.

Luke shrugged his shoulders and sighed again.

"Any time you get over this reform idea you've got, Hurry-Up, you come and see me," he said. "You know where you can find me. You've been pikin' for a long time. Just when I could put you wise to something good, you turn mama's boy. I don't quite get you."

He turned away and slouched down the hill. Bronson stood looking after him. It was true that he had been a piker, but he had been so only because of his passion for gambling.

Luke had intimated that he had graduated from the piker class. Bronson wondered what class he was in now.

Then he squared his shoulders and took a long, deep breath. To the deuce with Luke and his kind! He had something more to do and to think about. The railroad game was to be his game in future. Russell had hinted he might go far in it.

He was about to turn away up the hill when he saw Luke come under the station lights. Luke stopped and rolled a cigarette deliberately. He stood smoking it for half a minute.

Then the station door was opened and a man came out. He stopped and he and Luke talked for a moment.

The man started up the hill. When he came to the top of the hill, Bronson was standing there. The man did not look at him. Bronson recognized him.

He was the operator from the despatchers' office.

"Luke seems to know a good many people on this railroad," Bronson said to himself, as the operator crossed the street. "He seems to spend a good deal of time hanging about. I wonder if I ought to tell Russell that?"

He was puzzled by a great many things as he went to his boarding-house.

He had not been gone from the top of the hill more than five minutes when Crocker and Maloney came down from

Russell's office. As they neared him, Luke walked slowly up the hill.

Crocker, catching sight of him, quickened his steps. He and Maloney overtook the gambler before he reached the hilltop.

The men did not greet each other, but Luke said in a low voice:

"You fellows been on the carpet?"

"Russell wanted to ask Maloney how he came to have a hot box on a car to-night," Crocker answered in a voice as low as Luke's. "Maloney staved him off. What's on your mind?"

"This guy Bronson is gettin' pretty thick with Russell," Luke said. "He was up to your house to-night, Crocker."

"To my house?" Crocker breathed.

"Yeh. He drove the kid out of town so the kid wouldn't bother your sister-in-law, the pretty doll that works for Russell. He went up to your house to see her to-night."

"Where did he get acquainted with her?" Crocker demanded.

"Knew her back in our village," Luke said. "You better wake up, Crocker. For a sleuth you've been kind of slow. If that girl finds out anything, she's going to spill it all to Bronson. And Bronson will spill it to Russell.

"Russell's givin' him an engine right off the reel as soon as he learns the road. Where does Russell get that? A man don't usually get 'em together and then grab a right-hand box on another road inside a few days. I guess Mr. Bronson and Mr. Russell has a few things framed.

"Besides, Mr. Sleuth, Bronson is going to put you into clear if you bother him. He just told me so."

Crocker's ugly face grew purple from rage.

"Is that so?" he ground out. "I'll—"

"Don't tell me about it," Luke interrupted. "Tell it to Sweeney's nephew. There's going to be doings around here before long and the less I know the better off I'll be."

"You standing from under?" Crocker hissed. "I told you to keep Bronson interested in your game, so we would know where to lay our hands on him. You fell down. You four-flusher!"

"Say," Luke sneered, "turn over. I'm so full of news I'm ready to blow up. I just seen the op from the despatchers' office goin' to his supper. He sent a message for Russell a while back.

"Russell has sent for Fordney. Fordney will come here soon to work for Russell. Get that? Fordney!

"Now go home, Crocker, and get out your slate and figure which you'll be the most afraid of—Bronson's rough-house or Fordney's brains when Fordney works for Russell."

CHAPTER VI.

AT CROSS-PURPOSES.

RUSSELL and the man he had sent for, Fordney, sat in Russell's den two nights later. Fordney had got into touch with Russell that afternoon, and Russell had had him come over to the house. He thought it wisest to keep Fordney under cover while he worked.

During dinner Russell had sketched to Fordney what had taken place. Fordney had received the information in silence. But Russell saw that he had been turning it over in his mind.

"Let us take up these men one by one," he said now. "You are inclined to believe that Bronson is honest."

"I am," Russell returned. "Though he has been a card-sharp I don't think he's really ever been dishonest. He is an impulsive fellow whose blood runs red and strong.

"He doesn't drink. Gambling was a sort of exhaust for him. In his case there is a girl who could easily be responsible for his reformation. She's my stenographer and a mighty fine girl."

"And Maloney?"

"I think Maloney's crooked," Russell said, rather angrily. "I believe there is a gang that has set out to rob our cars. I think Maloney is working for the gang.

"You can see how valuable a conductor would be to a gang like that. He could set out a car anywhere the gang wished to operate. And he could set out the car that carried valuable merchandise."

"Crocker, then."

Russell's face darkened. He got up and walked back and forth across the room. Fordney sat and watched him quietly.

Something about Fordney disturbed the superintendent a little. Russell had heard a good deal about Fordney. He had heard that the detective was resourceful and relentless in his work. But Russell was very human himself, and he had not been prepared for the icy coldness of Fordney's demeanor.

Fordney, like Bronson, was a big man, but whereas the engineer was impulsive Fordney seemed to Russell to have gone to the opposite extreme. Fordney would coldly analyze, ruthlessly decide, and then strike, no matter who was hurt. Russell was not quite sure now that Fordney was the man for this problem, for Russell knew, better than any one else, that in the end mercy might serve better ends than justice.

For a moment or two now Russell did not speak. During his silence, Fordney's eyes, studying the superintendent, seemed to turn from their natural brown to black. His intense moment, whatever its cause, passed, and a faint smile finally came to his lips.

"Crocker is a brute, Fordney," Russell said at last. "He has been gambling, too. His work hasn't been what it should be. He acts like a man who has outside interests."

Fordney leaned forward in his chair.

"Have you learned anything about his 'outside interests'?" he asked quickly.

"That's what I got you here for," Russell said dryly.

Fordney sank back.

"Of course," he said. "Now, about Crocker's gambling."

"Recently a gambling-room has been opened in an abandoned mill at the edge of town," Russell said. "Crocker has been playing there. There is something in that which is in Bronson's favor.

"Bronson was there one night and refused to play. Crocker was playing. They got into some sort of row and Bronson struck Crocker. I suppose there's bad blood between them."

"Crocker's rather stupid, isn't he?" Fordney asked.

"No. In his own way he's intelligent. But I think he's had more money lately than he's been used to having."

"Ah," said Fordney. "It was Bronson, you say, who reported that Maloney had removed the waste from the box that went hot?"

"He didn't say it quite as plainly as that. He told me Maloney was the man for me to see."

"And later he reported that Crocker and Maloney had had a confidential talk when Crocker went to Maloney's house to bring Maloney here?"

"Yes."

Fordney sat drumming on the table with his long fingers. His eyes were fixed on the rug. He seemed to be thinking deeply.

"I'll tell you, Mr. Russell," he said at last. "There is something more to all this than is apparent on the surface.

"It may be that Maloney did remove the waste from the box. It may be he left a little waste in the box, believing it would be sufficient to run the short distance he had to go. Why he should have taken out the waste, of course, I don't know. There's something strange in that.

"But Bronson may have some reason for accusing Maloney. If he is clever, he wouldn't accuse Maloney openly. He would insinuate just as he has done. On the other hand everything he has said may be true. Maloney may have caused the box to run hot so that he would have to set out the car.

"Crocker and Maloney may be working together. But as it stands now, I wouldn't render any judgment even in my own mind, if I were you. Let me watch Bron-

son, Maloney, and Crocker for a while. I'll keep in touch with you."

"Very well," Russell said. "You have a free hand."

Fordney bade the superintendent good night. In the street he walked rapidly in the direction of Crocker's home. He stood across the street in the shadows for half an hour, looking impatiently at his watch every few minutes.

At the end of the half hour Crocker came out of his front door. Fordney did not stir. Crocker, without a glance to right or left, walked rapidly down the street. Fordney dodged along after him, still keeping in the shadows.

Crocker presently turned into a side street. Half-way down the block he disappeared into a mean saloon. He ordered a glass of beer from the burly bartender back of the bar.

He took the beer and walked to the end of the bar. The bartender came to him presently and began to fold up a newspaper which had been lying there.

"Any word for me?" Crocker asked.

"Not a thing," the bartender said.

Crocker finished the beer and went outside again. Fordney was in a doorway across the street. Crocker paused in indecision for a moment.

Then he started down the street in the direction of the tracks. When he came to these, he turned down them and was soon lost to view among the cars on the storage tracks.

Fordney turned back and walked rapidly till he came to a drug-store on the corner. He went into that and entered the telephone booth.

He called a number and when he got it asked if Bronson boarded at the house. He was told Bronson did. He asked if Bronson was at home. He was told Bronson was not.

He hung up the receiver and called another number. He asked if that was Mr. Crocker's residence, and Hazel Baker at the other end of the wire said it was.

"Is Mr. Bronson there?" Fordney asked.

There was a moment's pause on the girl's part. Fordney imagined her as too surprised to answer immediately. Then a man's voice came to Fordney:

"This is Bronson."

"Mr. Russell wishes you to come to the north end of the Amsterdam siding at once, if you will," Fordney said.

"What does he want?" Bronson asked.

"I don't know," Fordney said. "He merely asked me to phone to you. He will be waiting for you."

Fordney hung up the receiver and went outside again. He walked slowly in the direction of Crocker's house, two blocks away. In the middle of the second block he saw Bronson coming toward him on the other side of the street.

He let Bronson pass and then he crossed over. In a moment he was on the Crocker porch, with his hand on the push-button. Hazel answered the ring.

"Miss Baker?" Fordney asked.

"Yes," Hazel said.

"I have just come from Mr. Russell's," Fordney said. "I should like to speak to you for a few minutes."

"Why, yes," Hazel said, supposing it was company business which the man wished to discuss. "Come in."

Fordney entered and Hazel led him into the sitting-room. She motioned him to a chair and they sat down.

"Miss Baker," said Fordney briskly, "I am a railroad detective. I have been brought here by Mr. Russell to aid him in discovering who tried to rob a set-out car the other night.

"There are three persons whom I am interested in. One is a conductor named Maloney, another is Mr. Crocker, your brother-in-law, and a third is Mr. Bronson. I want to ask you about Mr. Bronson."

"Mr. Bronson was just here," the girl said. "He has gone only this moment."

"I know," Fordney smiled. "I phoned him that Mr. Russell wished to meet him. Ah, don't be angry with me, Miss Baker. It was important that I see you alone, and I had no time to lose. Frankly, in spite

of his past, I believe that Mr. Bronson is honest now."

"What do you know about his past?" Hazel asked, her cheeks flushing.

"We have to know, we have to discover, a good many things that are unpleasant," Fordney smiled again. "Will you tell me what the enmity between Mr. Crocker and Mr. Bronson was caused by?"

The girl gave him a startled glance. She considered a moment.

"No, I can't tell you that."

"You mean you will not."

"I will not."

"Has it occurred to you that the trouble Mr. Bronson had the other night might be a stage affair?"

Hazel's hand went to her breast. The color ran out of her cheeks.

"You mean that they may be working together?"

Fordney nodded.

"That isn't true," Hazel said passionately. "Mr. Bronson loathes Mr. Crocker."

"Ah," said Fordney.

The exclamation seemed to the girl to be pregnant with meaning. She started to rise and then she sank back in her chair.

"I don't mean quite that," she said. "Mr. Bronson has made some mistakes in the past, but he isn't going to make any more. He dislikes men generally of Mr. Crocker's type."

"He's impulsive, isn't he?"

"He is not so much so as he used to be."

"He had never met Mr. Crocker till he came here, had he?"

"No."

"Your brother has not returned home, has he, Miss Baker?"

Hazel was startled beyond speech by that question. She sat looking at Fordney. Fordney smiled.

"I have heard about that, too, Miss Baker," he said. "Now, I have come to you quite frankly, quite openly. I know I have not misplaced my confidence in you. Your chief concern is in regard to Mr. Bronson. You may be sure that no harm will come to Mr. Bronson if he is innocent.

"May I ask you not to mention that you have seen me? In the end I may be able to do more for Mr. Bronson than any one else could do."

"But what could Mr. Bronson want done for himself? He has nothing to hide."

"If life were as simple as that, there would be no use for detectives, would there?" he asked. "You know what a great percentage of convictions is based on circumstantial evidence. I don't know that Mr. Bronson will need my help, but if he should I promise you he shall have it."

The girl flashed her eyes up to meet the detective's. She caught there a look which made her shiver. It was a look which belied the kindness of Fordney's tone. The look held a bitter menace which a kind of hidden mirth in them did not lessen.

Whether the look was meant to intimidate her to silence, or to presage trouble for Bronson, she could not tell. She knew no railroad detectives but Crocker, and her knowledge of Crocker could not help her to solve this cleverer man's secrets. At any rate she saw no harm, but possible good, in following his lead.

"Very well," she said. "For the time I will say nothing about your visit."

Fordney rose.

"I won't keep you any longer," he said. "Thank you."

He nodded and left. At the drug-store he had himself driven to a family hotel in the suburbs. He went at once to his room. As he removed his collar and tie before his glass, he studied his reflection with an ironic smile on his lips.

"If she doesn't tell Bronson I was there, she will do more than any ordinary woman would do," he told himself.

About the time Fordney left Hazel,

Crocker was nearing the north switch at Amsterdam. He had begun to walk slowly, and he was peering along the tracks ahead of him as if he were looking for some one.

Presently the lights of Amsterdam showed. Crocker noticed that the block was white. In a moment a headlight appeared beyond the station. Without slackening its speed, the train passed the station.

Crocker stepped off the track to let the train pass him. When it had gone by, he stood looking after it till the rear lights were lost to view. Then he lifted a foot to step back on the track.

Before the foot touched the ground, Crocker was struck a terrific blow from behind. The foot came limply to the earth

Crocker's knees doubled up. He tried to turn his head to see who his assailant was, but he could not. He pitched forward on his face alongside the track and lay still.

A quarter of a mile away Bronson was hurrying toward the north switch which Crocker had almost reached when he was attacked. Bronson was beginning to wonder what in the world Russell was doing at Amsterdam at this hour.

His first thought had been that another robbery was being perpetrated and that Russell wanted his help. But there was no sound or sight of any struggle.

While he wondered, he saw the body of Crocker lying on the track ahead of him. He ran to it and turned it over. He cried out when he recognized the detective. He knelt and his hand went groping for Crocker's heart-beat.

Then from beyond the station there was an engine's cry. Another headlight showed. Bronson ran up the hill and hid among the trees.

He wanted time to think. He did not know how many persons were aware that he and Crocker were enemies.

His story of finding Crocker's body might not be believed. Journeys into the world of chance had sharpened Bronson's wits that much.

CHAPTER VII.

SLUGGED?

THE block at Amsterdam remained white. The train whose whistle Bronson had heard the second section of the train which Crocker had stepped aside to avoid—rattled past the station.

The engine came to the spot at which Crocker had been struck down. In the cab the engineer and the fireman sat on their boxes, their eyes on the lights ahead of them. The long, dark freight-train passed the place. The caboose came opposite it.

Conductor Terence Maloney had been sitting in the cupola. His flagman sat across from him. Suddenly Maloney cried out. His flagman looked at him in suprise.

Usually Maloney's nerves were steady. But now his red face seemed to have paled under his red hair. His eyes were staring.

"What's up?" the flagman asked.

"Did you see that?" Maloney cried.

"I didn't see anything," the truthful flagman answered. "What was it? A ghost up there on the road?"

"No. It was— it looked to me like murder."

The flagman's eyes popped out. He had seen an accident or two, but he was not yet inured to the possibility of tragedy on the rail. Besides "murder" was out of the ordinary even in that hazardous occupation which engaged him.

Maloney was looking back. The flagman noticed that his big hairy hand trembled as he steadied himself with it. Maloney suddenly straightened up and climbed down. The flagman followed him.

"A man was standing beside the track," Maloney said. "Another man came up and give him a wallop on the back of the head. He just escaped going under the

wheels. Wonder what I better do? Swing him down?"

"The guy's probably gone by now," the flagman said. "Did you recognize either of them?"

"I know the first man," Maloney answered. "He was Crocker—the company's detective. I'd know him anywhere, even if I didn't see his face.

"The other man was kind of familiar, but I don't know him so well. Big man with a kind of a hard-looking face. I'd know him again all right if ever I saw him. We're most into the yards. I'll wait and report."

The train passed the distant signal and came more slowly into the yards. As soon as it stopped, Maloney sprang down and ran for the telegraph office.

"See who's in the despatchers' office," he said excitedly. "See if the chief is there or the T. M. Maybe Mr. Russell is there himself. Anybody will do—even the trick man."

The operator broke in on the way-wire and repeated the message. There was a moment's pause while the operator in the despatchers' office held open his key.

"Russell is up there," the operator said then.

"Tell him there's some kind of a hold-up going on this side of Amsterdam," Maloney said. "Maybe it's that gang at work again. I saw a man put out by another man."

There was another pause after the operator had pounded this out.

"Russell says to cut off your engine and come down to the office," the operator said then. "He wants to see you right away."

Maloney ran out to the engine and repeated his instructions to the engineer. The head man cut off the engine and they sped down the track to the despatchers' office. Maloney labored up the stairs.

"Mr. Russell is waiting for you in his office," the operator said.

Maloney went into Russell's office. He repeated his story. Russell summoned the operator.

"Tell the night yardmaster to pick up as many men as he can and send them to Amsterdam on Maloney's engine," he directed. "Tell him there has been some kind of a row down there. If there are any revolvers in the office arm as many men as possible.

"Tell Dayton to hold all east-bounds at Amsterdam for this engine. Don't let anything get out of the yards. Tell that engineer to move lively. We may be able to land some of those fellows. Anyhow if there's a man hurt down there, we want to get help to him."

The operator ran back into the telegraph office. In a moment they heard him talking over the telephone to the night yardmaster. Russell turned to Maloney. The second trick man, having put out his stop order, came and stood in the doorway, one ear cocked to his sounder.

"What sort of looking man was it who struck the blow?" Russell asked.

"He was a big man—bigger'n I am," Maloney answered. "I've seen him before, I don't know just where. But for a minute I had an idea he worked for the road."

"You're sure it was Crocker who was struck down?" Russell asked.

"Positive. I'd know Crocker anywhere."

"Describe Crocker's assailant as minutely as you can."

Maloney bent his eyes on the floor. His red brows were drawn together in a frown. At narrative he was fairly good; description came harder.

"Well," he said at last, "he was tall and thick through the shoulders. He had a kind of a wide face with a big nose. He held himself kind of loose after he hit Crocker. That was one thing that struck me. He seemed even while he was doing a thing like that, kind of—of—"

"Graceful?" Russell prompted.

"Kind of graceful. Yes, sir. He wasn't any ordinary thug."

Russell rose and paced the floor. Every once in a while he glanced keenly at Maloney, but Maloney did not look

at him. The conductor sat with his hands hanging between his knees, his eyes cast down. The trick man took a step forward. He showed sudden interest.

"What is it?" Russell asked sharply.

"Why, Mr. Russell," the trick man said, "that description of Maloney's, while it's rather meager, fits the new man you were going to give an engine to soon—Bronson."

"That's the man," Maloney broke in. "I mind him now. I had him once, firing."

A look of incredulity flashed into Russell's eyes. Then that slowly died out, leaving his stare blank.

"Jim, see if you can get Bronson on the phone," he said. "Tell him I want to see him right away. Also have the boy call my stenographer. Wait here till he comes, Maloney."

As they sat there, they heard the engine pull out toward Amsterdam. The operator came to the doorway.

"The yardmaster got two switchmen and a fireman besides the regular engine crew," he reported. "They're on their way now."

"All right," Russell said.

He rose and went to the window and stood looking down into the night. It was quiet in the yards now. Somewhere up the track, out of his sight, the superintendent could hear the switch engine panting softly.

In the outer room the instruments ticked on. There was no indication here that the machinery of the road had slipped a cog down there by Amsterdam.

The trick man came back.

"Bronson is not at home," he said. "Your stenographer will be here in ten minutes. I left word for Bronson to come to the office as soon as he returned home."

"All right," Russell said again.

He returned to his place by the window. Maloney kept his former attitude.

In half an hour they heard steps in the outer office. Almost at once Bronson's big figure loomed in the doorway. Russell turned. Maloney did not look up.

"You wanted to see me, Mr. Russell?"

Russell gave Bronson a quick glance of appraisal. He found a new hardness in Bronson.

Hurry-Up was holding himself tensely. His eyes were brilliant with some suppressed feeling. His lips were compressed. He looked somewhat like a man at bay.

"Come in, Bronson," Russell said.

Bronson entered and sat down across from Maloney. He eyed the conductor with interest, though he showed no astonishment at finding Maloney there.

"How do, Maloney?" he said at last.

Maloney looked up. His eyes met Bronson's fleetingly. Then they slipped from the engineer's.

"Hello, Bronson," he said.

"I want you to wait just a minute, Bronson," Russell said. "I've sent for my stenographer."

Bronson shifted in his chair. For the first time he seemed to Russell to be ill at ease. Russell wondered if he and Miss Baker were mistaken in this man.

"What's up?" Bronson questioned. "Going to give me an examination? I haven't had one since I struck this pike. Thought maybe you dispensed with it in case of a good man."

"Oh, no," Russell said. "I want to ask you a few questions, Bronson. I want my stenographer here to take down whatever is said."

They did not speak again. In five minutes the operator came to the door.

"Miss Baker is here," he said.

"Send her in," Russell replied.

Hazel entered the room. She hesitated just inside the door. Bronson rose and placed a chair for her. Russell closed the door. He turned to Miss Baker

"Miss Baker," he said, "I'm going to ask Mr. Bronson a few questions. I wish you'd take notes on whatever we say."

Hazel took the cap off a fountain-pen and put her note-book on her knee. She looked at Russell. Bronson fixed his eyes on her face.

"Mr. Bronson," said Russell, "where did you spend the evening?"

"At Miss Baker's home."

"What did you do when you left there?"

"Why do you want to know?" Bronson asked.

"Crocker was attacked this side of Amsterdam a while ago," Russell answered.

"You think I attacked him?"

"I didn't say so," Russell rejoined. "Suspicion points to you."

"Who points it?"

"Maloney saw the face of the man who struck the other man down."

"And the face was mine?"

"So Maloney says."

Bronson turned slowly toward the conductor. Maloney forced himself to meet Hurry-Up's eyes. Bronson's lids were half-closed.

For a moment he contemplated the other man's red visage. Russell turned from one to the other. The girl sat with her pen poised, her brown eyes fixed expectantly on Bronson's face.

"Maloney's a liar," said Bronson at last.

Maloney's hot blood flashed into his face. His hands knotted. He half rose.

"Sit still, Maloney," Russell said.

"Bronson, I'm not accusing you," he added. "In fact I'd be the last man in the world to accuse you. I like you, though I've known you but a short time. You're my kind of man. You're strong and you're intelligent.

"I told you I wanted you to get along on the road and I meant it. I want you to feel that I am your friend in this thing.

"But what can I do when Maloney comes in and makes an identification of you in connection with an assault? It isn't an ordinary case. We've had trouble with thieves on the road. You're a newcomer here. I've got to go to the bottom of this affair."

"Certainly. I realize your position."

"Suppose then that we confine ourselves to the facts," said Russell dryly.

"That's what I'm doing," said Bronson without any show of heat. "Maloney's a liar and that's a fact."

"You mean he's mistaken."

"I mean he's a liar and he knows it."

Passion was twisting at Bronson's face. He was paler than usual. His eyes glowed and his mouth was hard set as he ceased to speak.

Directly in front of him the girl made a little movement. Bronson glanced at her. She looked squarely into his eyes. The passion seemed to die out of him.

"Oh, well," he said. "Go ahead, Mr. Russell. I'll be patient."

"Good enough," said Russell. "That's the spirit. What did you do when you left Miss Baker's?"

Bronson opened his lips to speak. He was puzzled as to just what he should say.

Was Russell himself square?

Did he know about the message to Bronson?

What sort of riddle was that anyway?

He glanced at Hazel. Her eyes urged him to tell the truth.

He was about to follow that silent injunction when the operator came to the door. He held a telegram in his hand. The hand was a little unsteady. The operator seemed to be excited.

Contrary to custom, he did not hand the message to Russell but verbally announced what it contained.

"That engine's over at Amsterdam now," he said. "They searched all the way from the place Maloney said he saw the scrap to Amsterdam."

Russell's hand dropped to his desk. Maloney breathed heavily through parted lips. Bronson and the girl exchanged glances again.

"They didn't find anything," the operator said. "Nobody or anything. The engineer says there isn't even a sign of a scrap anywhere along the track."

CHAPTER VIII.

STALKING THE STALKERS.

MALONEY stared stupidly at Russell. A look of astonishment crossed the superintendent's face.

"You're sure you saw what you have described, Maloney?" he asked.

"Of course I'm sure," Maloney said sullenly. "That man went down and he didn't get up. The other man ran away up that dark road."

"Perhaps Mr. Maloney saw a fantom of the rail," Bronson suggested.

"Perhaps he didn't," Maloney growled defiantly. "I know what I'm talking about."

"And you are still sure Bronson was the man who struck the other?" Russell asked.

"I'm sure," Maloney repeated.

"Maloney," Russell said slowly, "I don't think, as Bronson does, that you are a liar. I think you're mistaken. If I thought you were a liar, I'd fire you on the spot.

"But there's a mistake somewhere. It's incredible to think you'd say you saw an assault when there was none.

"But where did Crocker go? He couldn't have been badly hurt if he disappeared between the time Maloney's train passed there and the time the men got down there on the engine."

He turned abruptly to Hazel. "That will be all for to-night, Miss Baker. Maloney and Bronson, I want you to remain here for a while. I'm going into the other room to use the booth phone."

Hazel rose. As she did so, her eyes flashed a signal to Bronson which Maloney did not observe. Bronson, too, rose.

"If you don't expect to need me for twenty minutes, I'll walk home with Miss Baker, Mr. Russell," he said.

Russell turned round at the door.

"You'll be back?" he questioned.

"I'm not going to run away," Bronson answered quietly.

Russell went into the other room. In a moment Hazel and Bronson followed him. He entered the booth and they went down-stairs.

They did not speak till they had left the station and the despatchers' office behind. Then Hazel slipped her hand through Bronson's arm.

"There's something very mysterious about this," she said. "Why didn't you ask Mr. Russell why he ordered you to meet him near Amsterdam to-night?"

"I purposely didn't do it," Bronson answered. "I'm frankly puzzled. I can't figure out this game.

"I don't understand Russell at all. I don't even know whether he's on the level. Maybe he's a crook himself.

"Why doesn't he go after Maloney about the hot box that caused that car to be set out? Why doesn't he fire Crocker for gambling? It looks to me as if Russell was protecting some pretty shady employees."

"He isn't," the girl said. "He has a detective working for him—a man named Fordney. He borrowed him from headquarters. It was Fordney who telephoned you that Mr. Russell wanted to see you."

"And Russell didn't know anything about it?"

"No. Fordney discovered you were calling on me and he wanted to get you out of the way so that he could talk to me."

"What did he want to talk to you about?"

"He wanted to know what caused the enmity between you and Crocker, chiefly."

"Well, he'd want to know about that if rumors of it had come to him. Russell has apparently come to a point where he doesn't trust Crocker any longer. That looks good for Russell. But why in the world should Fordney send me on a wild-goose chase to Amsterdam?"

"And why should Maloney accuse you of attacking Crocker when Crocker wasn't there?"

Bronson was on the point of telling her the whole story, but he thought better of it. Though she had had nothing to say the night before about her brother going away, he knew that she worried about it constantly. The attack on Crocker could only worry her and puzzle her more.

"Perhaps Russell can straighten out some of the tangle when I go back—if he's on the square," he said.

They walked in silence till they reached her home. There she held out her hand. He held it a moment, his hungry eyes on hers, and then he turned and hastened back by the way they had come.

When he reentered the despatchers' room he saw Maloney sitting in one of the chairs used by the day operators. Bronson did not look at the conductor, but he could feel the latter's hot eyes on him as he went to Russell's door. Russell bade him enter.

As Bronson did so, he saw that there was another man in the room now. Though the man's back was to him, he instinctively felt that this man was Fordney.

His ready anger leaped up at Fordney because Fordney had tricked him.

Russell spoke Bronson's name and then Fordney's and the man rose and faced Bronson. Bronson shook hands with him frigidly, but he searched Fordney's face keenly.

He had expected a man somewhat like Crocker. But he quickly saw that Fordney was not like that. The same hard quality in the man which Russell had felt impressed itself on Bronson.

"Mr. Fordney is working for me in Crocker's place, during Crocker's absence, Bronson," Russell said.

"What was your idea in sending me on a wild-goose chase to-night, Fordney?" Bronson demanded.

"I wanted to get you out of the way so that I could talk to Miss Baker," Fordney answered.

"Yes!" Bronson spat out. "Well, let me tell you: You keep away from Miss Baker or I'll break you in two. Do you hear? I won't stand for that kind of business. I haven't done anything and don't propose to be hounded myself or have her bothered.

"I've been pretty patient. Here Russell has a crooked detective working for him and a crooked conductor, and he doesn't fire either of them. Yet he seems to take a lot of stock in a fake story of my attacking a man."

As Bronson concluded he saw that Fordney's eyes were burning and that his lips were hard set. Back of Fordney's eyes there was a passion equal to Bronson's own at its intensest moment.

"We'll get around to Crocker and Maloney in our own good time," Fordney said presently, and the flame in his eyes burned down a little. "We've just started to look into these car robberies, you must understand.

"As for Miss Baker: I merely went to see her as part of the day's work. We can't overlook anything. I thought she might drop a hint about you."

Fordney was beginning to snap out his words.

"Bluster won't get you anything with me. I'm not afraid of you. If I want to interview any one, I'll do it, no matter who it is. Did you see Crocker over at Amsterdam?"

The sharpness of Fordney's tone had begun to anger Bronson the more, but the question was like a dash of water on the flame. He saw he must be on his guard.

"What do you mean?" he demanded.

"I followed Crocker to-night when Crocker left his house," Fordney said. "He headed for Amsterdam himself. I thought possibly you met him there."

"What if I did?"

"If you did, you two would have fought —unless the fight you had at the Red Mill was a stage affair."

"You're doing a little mental detecting now, aren't you?" Bronson sneered. "You think that all these accusations and counter accusations are merely bluffs. You think Maloney and Crocker and I and some others you don't know about have got together to loot cars on this railroad. That it?"

"Almost anything might have resulted from you and Crocker meeting in a lonely place to-night," Fordney said, ignoring the question. "If you and Crocker had not been fellow crooks there'd have been a row."

"Maloney says there was a row," Bronson snapped. "He says I put Crocker

out. According to your way of figuring that would make me not a crook, wouldn't it?"

"It would prove you were not a pal of Crocker's," said Fordney insultingly. "Men don't stage fake fights on a lonely railroad right-of-way. That's about all it would prove to me just now."

"You're welcome to that much," Bronson retorted.

"You didn't attack Crocker then?"

"I did not. When I've got anything to settle with a man, I give him a chance to fight back right in the open."

"Did you see Crocker down there by Amsterdam?"

"I did."

Russell's chair squeaked as he whirled about in it to stare at Hurry-Up.

"Where was he?"

"Lying alongside the track. Maloney's train came along and I hid in the bushes. I wasn't taking any chances.

"After the tail-lights had disappeared I went back to Crocker. He was reviving then. I helped him to his feet.

"We walked along the track till we came to the crossroads. He was pretty groggy, but he knew what was going on by that time."

Fordney took out a cigar-case and selected a cigar with deliberation. His eyes were dropped down. He gave no sign that he had come to a point in his questioning from which much might be evolved.

Bronson was none the less cool, for Bronson had made up his mind just how far Fordney was going with him. Bronson took out an ancient pipe and stuffed it with tobacco.

The two men struck matches simultaneously. Across the little flares of light their eyes met.

"And when you got to the crossroads where did you go?" Fordney asked.

"I went home."

"And where did Crocker go?"

Bronson blew out a cloud of gray smoke.

"You'll have to find that out for yourself, Mr. Fordney," he said. "You're a detective."

Fordney got up slowly.

"Very well," he said. "Perhaps I can. Will you wait for me here for half an hour? Something has just occurred to me—something that may be of very great value in this matter and again may not. If I do not return in half an hour, I shall not be back to-night."

He went out. Russell looked at Bronson impatiently.

"I don't see why you can't be a little franker, Bronson," he said. "You're only making the muddle worse than it is."

"I'll play my own hand," Bronson said with a smile. "If that's insubordination, you can fire me, Mr. Russell."

"I have nothing on you," Russell said. "I'm going to fire somebody—or put somebody in jail—before long. That's sure. Who it 'll be I don't know yet."

They sat in Russell's office for forty minutes. Fordney did not return nor was there any word from him.

"You needn't wait any longer, Bronson," Russell said. "I wish, though, that you would lay off for a couple of round trips. I may want to see you."

"Very well," Bronson said.

As he went through the despatchers' office, he heard Russell tell Maloney he need wait no longer.

Bronson went slowly down the tracks. When he reached the station a freight-train was pulling by. He walked along beside it till he came to the road.

Except for the station lights just beyond him, there was darkness all about. Idly he watched the clattering wheels. Then his eyes wandered down the train to the caboose lights, just beginning to show.

He was restoring his gaze to the wheels when it was arrested midway.

At his left hand, ten feet from him, was a crossing-tender's shanty. There was no night tender and the shanty was now locked and dark. While Bronson had looked, a man's face had been thrust for an instant from behind the shanty.

Bronson addressed his attention again

to the wheels of the train. At length the caboose came opposite him. A flagman was leaning down, looking ahead at the yard-lights. Bronson waved to him unconcernedly.

As the caboose passed him, Bronson crossed the tracks. Over there there was a lumber-yard. Bronson passed beneath the shadow of the piled-up lumber and continued on his way. He did not look back, but he had a feeling that some one was following him.

Before he reached his boarding-house there was a vacant lot. Big maple-trees, in heavy leaf now, bordered the sidewalk. It was quite dark beneath the trees.

When he reached the first of them, Bronson began to walk rapidly. He wished to put himself so far beyond the man who was following him that the man could not hear his foot-steps. He believed that he had accomplished this before he reached the last tree.

Then he stepped from the sidewalk to the grass. The shadows were so dense that he was sure his action had not been observed.

He had only to wait a moment to verify this. He heard a soft thud on the turf just beyond him. The sound was made by the flying feet of some one running.

The sound came nearer. Bronson stepped from the tree as a man came within arm's reach of him. He thrust out a big arm and his hand came into contact with the man's collar. He gripped it and jerked the man from his feet.

The man let out a shrill yelp of terror. Bronson thought he recognized the voice. With both hands he held the man up in front of him and scanned his face. Then he laughed.

"You come along with me," he said. "If you make a noise or if you speak to any one we happen to meet I'll throttle you. Got a gun?"

He went through the man's pockets and found a knife and a revolver. He put these in his pocket.

They walked four squares and came to a big gray building. There was a light burning in a room on the lower floor. Bronson led his man up the steps and went into this room. A big man with iron-gray hair rose from a couch.

"Good evening, sheriff," Bronson said.

"Good evening, Mr. Deputy," Sheriff Sparks said. "Got something already?"

"Sheriff Sparks," said Bronson, "meet Mr. Tri-State Luke, proprietor of the Red Mill Gambling Palace and one of a gang which has been robbing cars on the railroad."

"You liar!" Luke screamed.

"He was following me in the dark," said Bronson. "I took a knife and a gun away from him."

"About to add murder to his list of specialties?" the sheriff asked.

"I wasn't!" Luke screamed again. "I was only trying to find out where Crocker was."

"Go on with the rest of it," said Sheriff Sparks in a gentle voice.

But Luke's manner suddenly changed. His excitement dropped from him. When he spoke again, his voice was cold as ice.

"Go on, eh?" he said. "You know where you can go to, don't you?"

CHAPTER IX.

DEEP GAMES.

BRONSON had no word from Russell till the evening of the next day. Returning to his boarding-house at dusk, he found a telephone summons from the superintendent. Save for a little tightening of the lips, Bronson gave no sign that the summons stirred him. He called Russell's home.

"What do you want?" he asked shortly.

"I want to see you about an important matter," Russell said.

Bronson hesitated. Since he had arrested Luke the night before, he had come to a determination of what course he was going to pursue. He had in his mind an orderly list of those who, he thought, were playing crooked in this game. And Russell was on that list.

What reason the superintendent had for being crooked Bronson could not imagine. Why Russell should sacrifice his career in a penny-ante game was beyond Bronson. But that was the way the cards were running.

"Very well," Bronson said, his hesitation passing. "I'll be right up."

Russell lived alone with one servant in a side-street just at the point where the business blocks gave way to residences. Bronson was soon at his front door.

The servant was not in evidence when Bronson rang the bell. Russell, in housecoat and slippers, opened the door himself. He put out his hand as any welcoming host might have done to a guest. Bronson returned his clasp without warmth.

Russell led the way into a little room at the end of the hall. He motioned Bronson to an easy chair and shoved a box of cigars toward him. Bronson did not take one.

"Have a drink then?" Russell asked.

"Never touch it," Bronson answered. "That's straight, too. I'm not just playing over against the book of rules."

"So much the better," Russell said.

He leaned back in his chair, shading his eyes. Bronson sat bolt upright.

"Bronson, you haven't heard anything about Crocker to-day, have you?"

The right corner of Bronson's mouth was lifted in a sneer.

"A good many people seem to think I know where Crocker is," he said. "How should I?"

"Which isn't answering my question," Russell retorted.

"Your question will remain unanswered," Bronson said. "If I knew where Crocker was, I'd have told you before—unless I wanted to keep him hidden. If I wanted to keep him hidden, I wouldn't tell you now."

"That's logical," Russell said. "Bronson, I'm going to be frank with you. I need your help. That's one reason why I hired you. I knew your record pretty well when you came here.

"I didn't expect to keep you on the road. I expected you to take Crocker's place. You'd have had a salary besides what the company paid you, of course."

"I'm no detective," Bronson said. "Besides why should you want to replace Crocker?"

"Because Crocker is crooked."

"You've come to believe that, have you?"

"He's been working with the car robbers."

"What leads you to believe that?"

"Oh, I can't give you my full source of information," Russell said. "But do you know that fifty thousand dollars' worth of merchandise has been stolen from this road in the last six months?"

"I didn't know the amount It's considerable, isn't it?"

Russell smoked for a while in silence, his eyes on Bronson's face. Bronson took out his old pipe, filled, and lighted it. He stared past Russell out of a cloud of smoke.

"You can see the position that puts me in, Bronson," Russell went on. "As superintendent of the road I ought to stop this thieving. I haven't been able to do it so far.

"I trusted Crocker to stop it. He failed. It was apparent he would fail when one knew the inside story."

"Yes, if one knew the *whole* inside story."

Russell leaned forward suddenly. His eyes were very bright

"What do you mean by that, Bronson?" he asked.

Bronson's anger flared up in his face. He, too, leaned forward a little.

"Russell," he said, "let's get down to man's talk. I never did like beating about the bush. Why did you send for me? What do you want me to do?"

Russell lowered his eyes.

"You've been a gambler, Bronson," he said. "You know what games of chance are. I don't suppose the stakes you played for were ever very high. How'd you like to get into a game that would

pay you so well that in a short time you could retire?"

"What kind of a game?"

"To go to work for me."

"I'm working for you now, am I not?" Bronson asked.

"You're working for the road. I want you to work for me personally."

"What doing?"

"To take up Crocker's work—*all* of it."

In his turn Bronson lowered his eyes. Russell looked up too late to see the glint of amusement and satisfaction that had come into them.

"I'd like to make a quick stake and retire," Bronson said.

"You will be ready, then, to do whatever I tell you to do?" Russell asked eagerly.

"I'll be ready," Bronson answered.

Once more Russell put out his hand. When Bronson took it now, he found it cold.

"You're a coward, too, Russell," he told himself.

"That's all you've got to say now, is it?" he asked aloud.

"That's all," Russell replied. "Just be ready."

Outside Bronson walked slowly down the street. He was smiling softly. He was finding this an easier game and more interesting than poker.

In a few minutes the lights of the station were ahead of him. The evening train pulled out. He watched the lighted cars glide past. He crossed the tracks and came to the row of trees which had sheltered him when he had caught Luke the night before.

In the roadway on the other side of the trees there was a sudden path of light. Bronson looked back. A taxi was coming swiftly. It passed him and stopped

A woman stepped down. The taxi turned about and went back to the city. The woman passed between two of the trees and stood before Bronson.

"Why, Hazel," Bronson said, "what's the matter?"

"I want to talk to you," she said. "Walk down this road with me."

They walked to the end of the road. There was an unfenced field there and a little wooded place on the other side of that. The girl kept on across the field with Bronson at her side. They gained the shelter of the trees; then she stopped and looked up at him.

"Dear," she said, "I was in the next room while you were at Mr. Russell's. I heard everything that was said—made notes at Mr. Russell's direction. Dear, Mr. Russell is trying to trap you."

"Trap me?" Bronson repeated gently. "I think not. I believed everything he told me."

"Why did you seem to agree to what he suggested then?" she asked.

"Because I am making a little trap of my own for Mr. Russell," he smiled.

"You don't think Mr. Russell is dishonest, do you?" she asked, wide-eyed.

"I'm pretty sure of it."

"Ah, but you're all wrong," she said "I *know* you're all wrong. If I could tell you everything, you would understand, but I can't do that now. Mr. Russell's calling you to-night was Fordney's idea Fordney thinks you are at the head of the gang of thieves."

"You heard him say so?"

"I heard him suggest it to Mr. Russell this afternoon. He doesn't say things, Fordney doesn't. He just suggests—intimates.

"He thinks you know where Crocker is. He thinks you have hidden him away. That is why they are trying to trap you. They think if they can get hold of Crocker they can make him confess."

Bronson laid his hand on the girl's arm.

"They want to find Crocker all right," he said. "But they don't want to find him to make him confess. They want to find him to get him out of the way. Crocker has confessed already."

"Confessed? Crocker? You know where he is?"

"He was in my room just before I went to Russell's to-night."

Hazel stared at him in amazement. For a moment she could not speak, and then she whispered:

"And you have discovered he is a thief as well as a gambler and a brute?"

"Yes," Bronson said. "He is a thief."

"But surely he doesn't accuse Mr. Russell."

"No. Crocker's rather stupid, honey. He can't figure anything out unless it's right before his nose. He told me everything he knew, and I put the rest of it together in what I think is proper shape. And it all leads up to Russell.

"I'll tell you a little about it, so that you'll understand. The night Fordney phoned me to meet Russell at Amsterdam I went right down there. I didn't think Russell was there any more than a rabbit.

"I didn't know what the game was, but I was willing to take a chance to find out. I stumbled on Crocker's body down there.

"At first I thought he was dead, but I succeeded in reviving him. He remembered a blow on the head and an attempt on his part to see who had struck him. Then of course everything was blank. He was pretty sick and his nerves were badly shaken.

"I guess I thought faster just then than I ever thought in my life before. I didn't know who had slugged Crocker, but I was sure that a cog had somehow been slipped for him. If I could play on his shaken nerves, I believed I could get a confession out of him.

"'They tried to kill you, did they?' I said.

"He looked up at me. There was a kind of frozen terror in his eyes.

"'Did you see them?' he said.

"'I didn't see them,' I said. 'I guess I came just too late. Maybe my coming scared them away. But they'll get you, Crocker. They'll be sure to get you.'

"He sank down beside the track and buried his head in hands. He was shaking like a leaf. He's a coward as well as the other things you've found him out to be. When you get a man's nerve in a poker game, you want to go after him strong. I saw if I could crowd Crocker hard enough now, I'd have him.

"'It's an awful sensation,' I said, 'to be in constant fear of death. A man can't tell when he'll get it or how. I guess not knowing how is worse than not knowing when.

"'They can do so many things when they have you picked out. They might knife you or shoot you or drown you or tie you to the track. That'd be fierce, Crocker, to be tied to the track and know that a train was bearing down on you to cut you to pieces. It'd be a dark night, of course, and out of the dark would come the glimmer of a headlight and then—

"'Or maybe they'd blindfold you so you couldn't see the light. Then all you'd hear would be the rattle of the train coming nearer and nearer to you.'

"Well, I never saw stark fear run through a man the way it did through Crocker while I talked. As I finished he got unsteadily to his feet.

"'Cut that out,' he said and his teeth chattered. 'I—I can't stand it! I'm pretty shaky. I've been hitting the booze regularly, and I guess the last drink died when I was struck.'

"'Well,' I said, 'it's pretty tough, but I don't see what you can do about it.'

"I had said all I could say. So I just stood there and let it sink in. I was afraid to ask him to go with me, for fear he'd think I was framing him.

"It came pretty hard to him to appeal to me, but it helped me that his case was really worse than I had thought it. I didn't know why it was worse, but so it seemed to be.

"'Well,' he said sullenly, 'can't you suggest something? You're the wise guy. We're like to be sort of brothers-in-law some time, I guess. I don't ask any help from you, Bronson, but I ain't thinking very straight myself. What'd you do if you was me?'

"'Why, you chump,' I said, 'I'd hide out of course. There's lots of places.'

"'Yes,' he said. 'There's lots of places.

And while I was going looking for one of them they'd finish the job they started to-night. Do *you* know of a place?'

"It was what I had been waiting for.

"'You can come to my boarding-house if you want to,' I said. 'You can be out of the open there for a while. But I'll promise you nothing. You and I don't like each other, so there's no use in our lying to each other. Suit yourself.'

"That talk seemed to ring truer to him than if I had promised to look out for him. He didn't want to go. He didn't trust me any too far, but he seemed to think I wasn't as great a peril to him as the others. I took him to my room. Then I sent for the sheriff.

"My reputation wasn't any too good, and I had been to the Red Mill. I knew Crocker was crooked, and I saw that my only protection outside of fighting fire with fire was an appeal to the law. The phone message worried me. I told the sheriff everything. He's got a good wise old head on him. He believed me.

"It wasn't my argument that did it all. Luckily he had something on Crocker himself. He found that Crocker and Tri-State Luke were running the gambling-room in the Red Mill together. We pieced out that they were probably in the car robberies together.

"Well, if the sheriff had come to my room five minutes later, he'd not have got Crocker's confession, I guess. A man, even so great a coward as Crocker, will get his nerve back if you give him time. The sheriff realized that, but he also realized that he could not go after Crocker hammer and tongs. He took the attitude of seeming to believe that there wasn't anything Crocker could tell him.

"'So,' he said, 'your game is up, is it, Crocker? You've been a professional gambler and a thief. You've been a traitor to your company by robbing their cars, and you haven't got much out of it, have you? That's the way it usually ends for you fellows that play the game on your own hook. Do you feel able to go along with me?'

"Crocker sat up in bed. He was shocked out of all sense. It was as if a man had walked up to a stranger and told the stranger the story of the stranger's own life.

"'You don't know everything, sheriff,' he said. 'What do I get if I tell it all to you?'

"'Huh!' said the sheriff in great scorn. 'You want to save your own skin, do you? That's the way with you pikers. You'll play the game so far and then you'll welsh to save yourselves.'

"'But I know a lot,' Crocker said.

"'If you told anything of value,' the sheriff said, 'you'd probably get immunity. I would do what I could for you.'

"Crocker then said he and Luke had been implicated in the car robbery. He gave a couple of other names. Just as I suspected, Maloney was one of the gang. He ran that box hot so that he could set out the car."

"But who struck Crocker down?" the girl asked.

"Some one hired to do it by Crocker's thieving friends," Bronson answered. "Suspicion had been pointing Crocker's way. His friends knew he was a coward and would go to pieces and betray them to save himself.

"They figured that so long as he was under suspicion he had lost his value.

"Alive, he had become a menance to them instead of an ally. Dead—well, he could tell no tales."

"But who suspected Crocker?"

"Russell—" Bronson began; but before he could go further the same thought leaped into the minds of both of them.

"Don't you see that that situation proves Mr. Russell innocent?" the girl broke out. "It was Mr. Russell who suspected Crocker. Sooner or later he would have Crocker arrested. Then Crocker would break down.

"Crocker's associates saw indeed that he was likely to become a menace to them and they tried to get rid of him. Now, Crocker has gone.

"Mr. Russell suspects you aided him

to hide himself. And naturally Mr. Russell suspects you. You must go to Mr. Russell first thing in the morning and tell him everything you know."

"It does look as if I had reasoned that part of it wrong," Bronson admitted.

"You *are* wrong," the girl said. "I know you are wrong. Some day, when this has all been cleared up, I'll tell you why. Believe me now, and do as I ask you to do."

"I'll do it," Bronson agreed. "But I'm more puzzled than I was. It's a good thing you were on the job for me."

They looked into each other's eyes. The silence of the night was all about them. Bronson made a movement as if he were going to enfold her in his arms. But she stepped back. His arms dropped to his sides.

"We'd better go back," he said huskily. "I'll take you home."

Half an hour later he opened the front door of his boarding-house and went up the stairs without seeing any one. The door of his room was closed. He opened it and stepped inside.

The room was dark except for the light from the stars and a crescent moon. Bronson made out Crocker lying on the bed.

"Crocker," he said.

Crocker did not answer. He lay motionless.

"What's the matter?" Bronson asked. "You're not sick, are you?"

He put a match to the gas-jet beside the dresser. Then he turned about and took a step toward the bed. He came to a dead standstill after that first step. His face was thrust forward. His eyes stared.

After a moment of this he advanced to the bed, unconsciously on tiptoe. He put a hand down and touched Crocker's forehead. It was quite cold. He searched for Crocker's heart beat and found his hand stained with blood.

Then he tore back the thin covering from Crocker's body. A revolver clattered to the floor from a heavy towel in which it had been wrapped to deaden the sound of the shot.

Whoever had been seeking Crocker's life had this time not sought it in vain.

CHAPTER X.

SURPRISES.

FOR a space Bronson stood and stared. He was sickened by the sight of that still form on the bed.

Crocker was dead! The thought began to reverberate through his brain.

He could not believe at first, though there was the gruesome evidence before his eyes, and on his hands was Crocker's blood. He sank into a chair.

Who had killed Crocker?

His mind would at first have flown to Luke, the futile, crooked, slimy gambler. But Luke was behind the bars of the county jail. Russell would not have done it, for Hazel had convinced him that Russell was straight.

Had it been Maloney?

He went to the head of the stairs and listened. There was no sound in the old house. He tiptoed back along the hall till he came to the bath-room, entered noiselessly, and washed from his hands Crocker's blood. How like a stain of crime it was! Then he retraced his steps and crept to the lower floor.

There was an old-fashioned telephone fastened to the wall. He took down the receiver and called the yards. Without giving his name, he asked where Maloney was.

He hung up the receiver with a look of deeper amazement on his face. Maloney was headed for home, a hundred miles away. He went up-stairs again.

He picked up the revolver and examined it closely. It was a cheap weapon of small caliber. Apparently it was new. It might have belonged to any one.

And then he realized his own danger. He and Crocker had been known to be enemies. His story of how Crocker came to be in his rooms might be disbelieved; the sheriff, despite his acceptance of Bronson's former story, might grow skeptical.

No one yet knew who had attacked Crocker on the other occasion. He had confessed to finding Crocker unconscious then.

If he had been rather suspected before, on the word of a man like Terence Maloney, what must be thought of him now, with Crocker dead in his room?

What should he do?

Flight, because of Hazel, was out of the question. He could not become a fugitive before the law. He was bound to face whatever there was to face.

Slowly into the soul of Hurry-Up Bronson the iron of resolution entered. He would stand to the music. That was the least he could do. If a careless view of life, coupled with his gaming-passion, had brought him to this pass, he would face his trial with what manhood he had.

Rapidly he went over recent events in his mind. No one had seen him and Crocker come to the house. Even if any one had, it didn't matter. The manner of Crocker's coming would make no difference.

He had told his landlady that Crocker was ill and would spend a few days with him. She had seen that he was fed. Crocker had had plenty of money.

Then there was Crocker's confession. Well, that wouldn't help him in this situation. It was no less a crime to kill a criminal than to kill an innocent man.

He went into the hall and locked the door. His watch showed nine o'clock. He had plenty of time. He was determined to make public that night the news of Crocker's death.

The only question in his mind was as to whom he should go first.

Should he go to the sheriff, to Russell, or to Hazel?

He shrank from bearing such tidings to Hazel. If he went to the sheriff, the latter, though his friend, might have him locked up. He decided he would tell Russell what had happened while he was still a free man.

He walked rapidly toward Russell's house. At a corner he saw, over a drug-store, a sign: "Dr. Smithnight." He hesitated a moment and then he climbed the stairs. There was a door with a "Walk-in" sign on it. He entered, and a man came from an inner room.

"I found a man dead in my room just now," Bronson said. "I wish you would go down there and have a look at the body to determine the time of his death."

"What was the matter with him?" the doctor asked.

"Shot."

"I'll go right down," the doctor said, as he took Bronson's address.

At Russell's house Russell himself answered Bronson's ring, as he had done before. At sight of Bronson standing on the steps Russell exclaimed:

"Back again, Bronson? Come in."

Bronson stepped inside. Something in his manner seemed to strike Russell. He turned, as he was about to go down the hall, and gazed into Bronson's eyes.

"What's up?" he asked.

Bronson stood looking down at him. His face was quite pale, but there was no physical tremor about him anywhere.

"Russell," he said in a low voice, "I know why you had me up here to-night. You suspected I wasn't on the level. I didn't tell you then that I was, because I equally suspected you. I couldn't fathom your game, but I had come to the conclusion that you were crooked.

"I've given over that notion. And I want you to believe I'm square. Anyhow, don't talk in riddles any more.

"Any work I do for you in future will be railroad work. Do you understand?"

Russell was plainly puzzled.

"If I was wrong, Bronson," he said, "I beg your pardon. I'll confess that I don't seem to be getting anywhere in all this business. What was it you wanted to see me about?"

"I have something very important to tell you," Bronson said. "It's a pretty grave turn in this affair."

Russell walked down the hall and opened the door of his den. Bronson followed him.

"Come in," Russell said.

He led the way into the room. As Bronson also entered, Fordney rose from a chair by the table. Bronson stopped abruptly.

"Ah, Bronson," Fordney said easily.

"Howdy," Bronson said.

Russell and Fordney sat down. Bronson stood looking at them. They fixed their eyes on his face. There was something uncanny about Bronson's gravity, his steadiness.

"Well, Bronson," Russell said.

"Crocker is dead up in my room—murdered," Bronson stated.

Russell was startled, stupefied. Bronson watched Fordney. An astonishment so great that it could not be otherwise than genuine dawned in Fordney's eyes. He was taken off his guard—plainly aghast at Bronson's news.

"Crocker dead—murdered?" he asked.

"Shot to death," said Bronson. "I found him just a bit ago."

Russell and Fordney sat staring at the engineer in dumb amazement. At last Russell found his voice.

"Certainly *you* didn't shoot him, Bronson," he said.

"Certainly not," Bronson said. "He was quite dead when I found him."

"You took him to your room the night you found him injured near Amsterdam?" Fordney asked.

"Yes. He's been there ever since."

"You have no idea who killed him?"

"Not the slightest."

Fordney paced up and down the room. The man's iron nerve seemed shaken. He was having difficulty pulling himself together.

"And now if you'll call the sheriff," Bronson said.

Russell looked up quickly.

"You are going to give yourself up, Bronson?" he asked.

"Of course," Bronson said. "Oh, I know it looks black for me. Crocker and I were not on good terms. We'd had one quarrel. People will think I killed him. But I've got to go through with it."

Russell shot him a look of admiration, and Bronson felt that Russell's suspicion of him was dead.

"Let's wait a little," Russell said. "Let's talk this thing over."

"There's no use waiting," Bronson said. "If I'm going to do any talking I'm going to do it officially."

"Very well," Russell agreed. "Call the sheriff, Fordney, will you?"

Fordney put in the call. The sheriff said he would be at Russell's home in ten minutes. His car, he said, was at the jail-door then.

"I'd better send for Miss Baker, Bronson," Russell said. "Whatever you say she can take down. There will be no question about it when you—come to trial."

Bronson considered. He wanted to be as kind to Hazel as he could. Perhaps the kindest way would be to let her hear the story from his own lips.

"All right," he assented.

Russell took up the telephone and called the girl. She said she would come at once.

Soon they heard a machine stop in front of the house. Russell hastened to the front door and opened it before the sheriff could ring. The sheriff followed the superintendent into the room. His first glance was for Bronson.

"Mr. Bronson found a dead man in his room to-night," Russell said. "He wished to tell you about it."

"Who was the dead man?" the sheriff asked quietly.

"Crocker—our detective," Russell said.

"Oh, yes," the sheriff said.

There was a knock on the door. Russell opened it. Hazel came in, her note-book in her hand.

"Sit down at the table here, Miss Baker," Russell said. "I want you to take some notes."

Hazel sat down. Her eyes met Bronson's. Bronson advanced to the table.

"Hazel," he said gently, "I want to tell you something before we begin. Your brother-in-law, Crocker, is dead. I found

him in my room to-night—murdered. I had nothing to do with the murder. He was quite dead when I found him."

Hazel did a curious thing then. She did not in the first moment concern herself with the peril her lover might be in.

She stole a glance at Russell. Russell's eyes met hers. Gladness was in her eyes; in Russell's a kind of sad disbelief.

Bronson was surprised.

"I am not guilty, Hazel," he said.

"Of course not," she said.

"Tell us about it briefly, Bronson," the sheriff interposed. And he added formally, "Whatever you say will be used against you."

"I had been out during the evening," Bronson began. "I was here with Mr. Russell for a while. Then I spent some time elsewhere."

"Elsewhere?" said Fordney.

"I arrived at my boarding-house a few minutes before nine," Bronson went on. "I know it was that time because it was nine when I left the house after finding the body. I went into a doctor's office on the corner and asked him to go and look at the body. Then I came here."

He paused and gave a little laugh.

"That doesn't sound very strong," he continued. "It's pretty bald. I thought there was more to tell. I guess there isn't. But that's the truth anyhow."

"Who was the doctor you asked to view the body?" the sheriff asked.

"Dr. Smithnight."

"May I use your phone?" Sparks asked Russell.

"Certainly," Russell consented.

Sparks ran through the book till he found the doctor's name. Then he called his number. He talked for a moment.

"Dr. Smithnight says Crocker was killed along about half-past seven o'clock," the sheriff said as he hung up the receiver. "He finds that *rigor mortis* is about to set in. The man couldn't possibly have been killed at nine o'clock, the time at which Mr. Bronson reached home."

"Bronson left here at eight o'clock," said Fordney. "I recall that when I heard him leave I looked at my watch."

"You looked at your watch?" said Bronson. "Were you here when I was the first time?"

"I have been here since six o'clock, when I came home to dinner with Mr. Russell," Fordney said equably.

Bronson, for one of the rare times in his life, flushed before Fordney's cool stare.

"Bronson," said Russell quickly, "you are sure you didn't go straight home from here? You're sure you didn't arrive there shortly after eight instead of nine?"

"I am sure," Bronson answered.

"Bronson," the sheriff broke in, "your liberty, perhaps your life, may depend upon your proving you didn't go directly home from here. Of course I admire any man for keeping a promise he has made, as seems to be your case. But I ask you to consider well how important it is that you tell us where you were between eight and nine o'clock."

"I don't feel at liberty to tell you," Bronson said. "I don't want the name of the person I was with dragged into this."

Hazel's note-book fell to the table. They all turned to her and found she had risen. She came from behind the table to stand at Bronson's side.

Bronson smiled down into her eyes.

"Mr. Bronson was with me between those hours," she said.

"With you?" Russell said. "Why, he left here some time before you did."

"I overtook him in a taxicab," the girl explained. "I wished to speak to him about a matter I thought was important. We walked up Eleventh Street to that vacant field, crossed the field, and came to the woods beyond. We were in those woods quite a little while. Then we walked back.

"It was ten minutes to nine when I reached home. That would bring Mr. Bronson to his boarding-house about nine o'clock."

Russell breathed a deep sigh of relief.

"I'm glad you got that taxi, Hazel," he said, as an elder brother might have spoken. "But you two better be careful about going to lonely places like that at night. The times are unsafe. Car robberies and murders—and Heaven knows what next."

Hazel lifted her head.

"I am not afraid when I am with Mr. Bronson," she said softly. "You see, I am Mr. Bronson's wife."

CHAPTER XI.

THE THIRD DEGREE.

"BRONSON'S wife?" said Russell, with a stare of astonishment.

"Yes, I am Mrs. Bronson," Hazel said. "While we are here I wish to tell you how that came about. My husband has told you that he has been a gambler—a crooked gambler. That was his one big weakness. He didn't seem to be able to leave cards alone—till just recently.

"I met him in our home town a year ago. We became engaged. I didn't know then about the gambling. He played off and on secretly. The place where he played was run by this man they call Tri-State Luke.

"Six months ago Luke's place was raided. I—I gave the officials information about it when I asked Mr. Bronson if he was playing there and he said he was. Luke tried to reestablish himself back home, but he was too closely watched.

"I came on here after my marriage, and you gave me a position, Mr. Russell. I was quite unhappy and I wanted to be with my sister. When Mr. Bronson lost his place on the road he came here, too.

"I was afraid for him, because I had heard through Mr. Crocker that Luke had opened a gambling-room in the Old Mill. But Mr. Bronson went there, and he didn't play. Since then he has been his own master.

"It is ironical that he should have been surrounded by suspicious circumstances since he has been here. But I know he is innocent of any wrong-doing and my place is by his side.

"We had an agreement to make no announcement for a year—to be even less to each other than we had been before we were married. But all these things that have happened have changed the situation."

"When were you married?" Russell asked.

"I'll answer that," Bronson replied. "Miss Baker loved me more than I deserved. After the raid I promised her I would never play again. But she was afraid of a mere promise. She wanted proof.

"She said that she would never give me up—that she would stand by me always. But she felt that I should conquer myself by myself.

"We were married a little less than six months ago. She said that if I knew her life was linked to mine for the rest of our lives I might reform. She asked me to remember that there was no way out for her from that time on. Whenever I should hurt myself through yielding I would hurt her.

"I had her happiness in my own hands. She left that thought with me, and then she went away. I was to come to her at the end of a year. She would believe whatever I told her. Then we would decide what our future course was to be.

"When I lost my job back there, I was heartsick for a sight of her. So I came here and you gave me a job on the road. My wife and I were no more than good friends. We were keeping to our agreement till to-night. The rest you know."

"Well, you've got an alibi so far as Crocker's death is concerned," Fordney said. "I don't know what the sheriff wants to do."

The sheriff had been staring down at the rug. Now he lifted his head. There was a glint of amusement in his eyes. He gave Fordney a tight-lipped smile.

"I think I'll take Mr. Bronson along with me," he announced.

Fordney shrugged his shoulders.

"You're the doctor," he said. "You fellows have got to accuse somebody when a murder has been done."

"I haven't accused anybody," Sparks said, in a low voice. "I merely said I was going to take Mr. Bronson along with me."

"Will Mr. Bronson be admitted to bail?" Russell asked.

"I haven't anything to do with bail," Sparks answered. "The court decides about those matters."

Russell got to his feet. He put out a hand to Bronson.

"I'll stand by you, Bronson," he said. "Don't worry. Whatever can be done for you will be done."

"Thanks," Bronson said.

Hazel took a step toward the sheriff.

"May I accompany my husband?" she asked.

Sparks nodded.

"Come along, Mr. Bronson," he said. "We may as well be moving."

They went out into the hall. Russell accompanied them to the door. The sheriff put Bronson and his wife in the rear seat and climbed up beside the driver.

In a few minutes they drew up before the county jail. The sheriff sprang down and Bronson assisted Hazel to alight. They went to Sparks's apartments. Sparks called his wife and asked her to care for Hazel.

"What are you going to do with Mr. Bronson?" Hazel asked.

"Mr. Bronson is going to play a little poker," the sheriff said. Hazel gasped.

"But not with cards," the sheriff laughed. "It's going to be a two-handed game between him and Tri-State Luke."

"Will it be dangerous?" Hazel asked.

"You two are in no danger while you are here," Sparks answered. "That's why I brought you. Some people would mighty well like to have Bronson at liberty for a while to-night."

The two women went out and closed the door behind them. Sparks's jocular manner dropped from him.

"You've got to get the truth out of Tri-State to-night, Bronson," he said.

"This thing is getting gummed up. There seem to be wheels inside o' wheels here. Who killed Crocker? It wasn't Fordney, it wasn't Tri-State, it wasn't Maloney. There's somebody else. Make Tri-State tell you who it was."

"I'll try," Bronson said. "Where's his cell?"

The sheriff led him into a square room and opened an iron door. They stepped into a long, dark corridor. Sparks handed a key to Bronson.

"Fifth door on the right," he said.

Bronson walked down the corridor. Through the bars of the cell indicated he saw that Luke was asleep on his hard bed, his head pillowed on a thin arm.

Noiselessly Bronson opened the door and entered, turning the key after him and putting it in his pocket. He sat down on the one chair there was in the bleak place.

From his pocket he took an automatic revolver. He held it in his right hand so that it refracted what little light fell upon it. Then he spoke Luke's name. Three times he had to do that before Luke stirred. Then the gambler rolled over on his back.

"Get up," said Bronson.

Luke sat up suddenly, staring. His face was like dirty chalk. His eyes were bloodshot and his lips quivered. Robbed of his drug, he was suffering the terrible reaction.

"Who you?" he asked thickly.

"Bronson," said his visitor.

Luke slowly slid to the edge of the bunk. He rubbed his scant hair back from his forehead. Then his eyes caught sight of Bronson's weapon.

"What's the gun-play?" he asked.

"It depends."

"On what?"

"On whether you tell me what I want to know."

"Suppose I don't?"

"Then I'm going to kill you."

"Never knew you was a killer, Hurry-

Up," he said, but he shivered through his whole body.

"Crocker's dead," Bronson said.

"Who got him?"

"That's what I want you to tell me."

"How 'm I to know? I been locked up here for a year or two—seems that long, anyhow. I ain't done nothin'. I can't talk much, Hurry-Up. I'm sick."

"Crocker was in my room when he was killed," Bronson said. "They think I did it. I didn't do it. If you don't know who killed Crocker perhaps you can make a guess."

"I'm a bum guesser," Luke said.

"Very well," said Bronson with a little sigh. "If you don't tell me in five minutes by my watch I'm going to shoot you. If I don't get the dope from you, I'll be found guilty of Crocker's murder anyway. But I'll be even with you, Tri-State."

Luke looked listlessly at the engineer, peering up as he sat with his arms on his knees.

"I might as well look at a stone wall," he said at the expiration of three minutes. "You got your poker face working overtime to-night, ain't you, Hurry-Up? Nobody never could tell when you was hanging a bluff, could they?

"Do you really mean you'd fire that gun into me? Say, point it away from me. My nerves ain't none too good."

He rose and went to the door and put his hands on the bars. He shook them in a sudden spasm of rage.

"If I ever get out of here," he whispered, "I'll do some killin' myself. I'll die in here if they don't let me out soon."

He turned and leaned his back against the bars. The revolver's muzzle was pointing in his direction. Back of it was Bronson's mask of a face—cold, passionless, unrelenting.

"Don't look like that, Hurry-Up," Luke said. "Get mad or something. Show a little life. You make me think of a corpse. Quit it, I tell you! You're givin' me the willies."

"Thirty seconds," Bronson said.

Luke's nervous fingers clutched the bars back of him. His dull eyes went suddenly bright with fear.

"You're out of your mind, Hurry-Up," he said with a little hysterical catch in his voice. "You've gone clean nuts. What's eatin' you? Can't you be human?"

Bronson snapped the case of his watch shut and slipped the watch into his pocket.

"Two seconds, Luke," he said.

Luke's emotion suddenly died out of him. There was not enough vitality in his mind or in his body to feed it. He crossed to the bunk and sank down upon it.

"What do you want to know?" he asked huskily. "Get it over with an' lemme lay down again."

"Who was in the gang that has been robbing the cars?" Bronson asked.

"Me, Maloney, Crocker, two other men I never met before the night we had the mix-up at Amsterdam—and Fordney."

CHAPTER XII.

CONFESSION.

FORDNEY!

The shock of that statement was so unexpected that Hurry-Up had need of all his reserve will-power to retain the poker mask upon his face. However, when he spoke again his voice was as chill and level as ever.

"Fordney is the leader, eh?" he asked in the same tone he would have used in saying, "Lay down; what you got?"

"He's the big noise," Luke assented, apparently unaware that his revelations were causing any excitement in his hearer.

Indeed, Tri-State was now speaking with the glib freedom of a man who is used to squealing on his pals whenever it becomes necessary to save his own bacon by so doing.

"It come about like this," he went on. "Crocker and me has knowed each other for years. He's always been crooked. I had a little shop here once before some

years ago. When I couldn't do no business in our burg I come back here.

"I looked up Crocker. Together we financed the game at the Old Mill. We done well right from the jump. Young Baker, Crocker's brother-in-law, was steerin' better'n he ever steered in his life before. Crocker made him. He was afraid of Crocker.

"The kid's sister had about got him straightened up when Crocker butted in. The kid was workin' and all that. He's a good-looker an' makes friends. He can play the piano and sing an' dance, you know. Clever, that lad. Well, he got into good society here, an' he found a good many sports that was nuts for us."

"Hold on a minute," Bronson interrupted. "If you and Crocker were in cahoots why did you want to steer me up against him to trim him that night you introduced us as Mr. Gray and Mr. Treat? Remember?"

"Ye', I remember," said Tri-State. "I done that because Crocker thought he was a little too slick with the cards. He thought nobody could turn a mitt as good as he could. I just wanted to show him that he didn't have the nimblest little finger in the U. S. A., that was all; and if he got trimmed when he was being shown, I should bibble. And then again I wanted you back in the game. I figured if you got the habit once more you might join out with me, and then I planned to slough Crocker. The big stiff!"

"I see," nodded Hurry-Up.

He felt a mental retching at the very thought of being in partnership with this rat, but was careful not to allow his emotion to show in his impassive features.

"Go on," he urged. "How did Fordney get into this?"

"Here's how it was," Tri-State told him.

"One night Crocker brung Fordney down to the Mill. Fordney played a bit and then he waited till everybody but him an' me an' Crocker was gone. Then he sprung his car-robbing game. We got away with quite a bunch of stuff. Fordney laid the plans. We done the work. But Fordney was square. He give us good split.

"But Russell begun to suspect Crocker and Maloney. That hot box dope of yours opened his eyes about Maloney. So he sends for Fordney. That's natural, for Fordney has never neglected his business since he turned crooked. He always kep' tellin' us to have a reputation and a respectable job to fall back on. He says that's the best alibi.

"As soon as he finds Russell suspects Crocker he begins to plan to put Crocker away, for he knows Crocker is as weak as putty in a pinch. And he knows Crocker will save himself before anybody else. Crocker won't stick for the big show."

Bronson suppressed a smile at this. It amused him to hear the Tri-State pot call the Crocker kettle black.

"So," Luke went on, unconscious of Bronson's amusement, "Fordney sends Crocker out to Amsterdam the night Crocker is slugged. Then he phones you to go out there to meet Russell. He's killin' two birds with one stone. To show you how he figgers: He has Crocker slugged just about the time Maloney is due to come by on his freight. He makes sure about Maloney by the telephone before he starts Crocker an' you on your way.

"He follows Crocker to the tracks and then he beats it to your girl's house to establish a alibi for himself. He says an alibi from one stranger is worth fifty-seven from friends. He even tells the girl he has sent you on a wild-goose chase. He's like the guy in the show that rolls up his cuffs an' says he has nothin' to conceal.

"Well, there is a strong-arm guy waitin' for Crocker. He slugs Crocker, but the blow don't smash that solid-ivory skull, an' you find Crocker an' take him home and bring him back to life. Instead of you bein' accused of killin' Crocker with a black-jack, Crocker disappears an'

there ain't no corpse to rise up and confront you. What else, Hurry-Up?"

"What were you following me for the night I brought you here?" Bronson asked.

"To see if I could find out where Crocker was. Fordney give me that job exclusive. He knows Crocker is weak an' he knows Crocker will spill himself to you about the whole business."

"He didn't spill about the whole business," said Bronson.

"Heavens, how afraid of Fordney Crocker was! Even to save his own skin, he wouldn't tell on Fordney. Or perhaps he was more intelligent than we figured him. Perhaps he foresaw that if we failed him Fordney might help him, if he remained stanch to Fordney. Now, then, who killed Crocker?"

"I swear I don't know," Luke answered. "But I suppose it was some guy that Fordney hired. You can be sure Fordney would find out where Crocker was sooner or later."

Bronson rose. He moved toward the door. Luke still sat on his bunk with his hands half covering his face. Bronson put the key into the lock.

"Say, Hurry-Up," the gambler said, "what do I get out of this?"

"I'll do what I can for you, Luke," Bronson replied.

"What time is it?" Luke asked.

Bronson looked at his watch.

"Ten minutes to twelve," he answered.

"On a Thursday night?" Luke said.

"On a Thursday night," Bronson agreed.

"Three hours and ten minutes till three o'clock Friday morning," said Luke.

Something in Luke's voice caused Bronson to turn back to him. Luke was sitting up straight on the edge of the bunk. His thin lips were curved in a smile. He was looking at the wall opposite him.

"What is it, Luke?" Bronson asked. "What about three o'clock to-morrow morning?"

"You go call the sheriff," the gambler directed.

Bronson went out and returned with the sheriff almost at once. On the way to Luke's call Bronson briefly outlined the gambler's confession.

"If I give you a tip on the big thing will you let me go?" Luke asked Sparks.

"I can't let you go," the sheriff said. "But you're not so very deep in all this business. If you help us, I'll guarantee that the court will let you go. It's the custom."

"Be a good fellow and get me a drinkin'-glass—a tumbler half full of whisky," Luke said.

Sparks looked at Bronson. Bronson nodded. Sparks brought the whisky. Luke sipped at it and gulped it till he had taken all of it.

"Whaugh!" he breathed. "How my nerves lick that up! Well, I'll tell you something. At three o'clock to morrow morning an express-train will show up at Torrey, a little town sixty miles south of here. There ain't nothin' at Torrey but a telegraph shanty an' a passing-track. The rest is woods and fields.

"This here express-train is comin' from the south an' it will have a bunch of gelt on board. Fordney is out for that gelt. He's got a choice bunch of side-kickers picked to help him. It's his big play.

"They're goin' to derail that express an' blow it over the tree-tops at Torrey. They figure the vicinity of Torrey will look like a gold-mine has sprouted there. Now you can show 'em whether you are really the hurry-up kid or not, Mr. Bronson. Lemme sleep."

CHAPTER XIII.

AMBUSHED.

AS Luke, soothed by the whisky he had drunk, slipped back on the bunk, the sheriff threw open the cell door. Bronson hastened after him into the corridor.

"By the way," said Sparks, "did he say who killed Crocker?"

"He didn't know," answered Hurry-Up. "Do you?"

"Haven't an idea," responded the sheriff.

"Well, that'll keep," Bronson said. "The thing to do now is to get down to Russell's and notify him about this hold-up. If Fordney is gone, it will lend color to Luke's story."

As they stepped into the street, they found rain pattering down. The asphalt was already aglisten with it under the lights. To the southwest there was a long, easy flare of lightning.

They reached Russell's house in a few minutes. It was in darkness. They ran up the steps and Bronson rang the bell. In a moment or two, with the promptness of the old-time rail, Russell appeared at the doorway.

"Is Fordney here?" was Bronson's first question.

"He left just after you did," Russell said. "What's the matter?"

"A plan's afoot to ditch Sixty-Six at Torrey and blow her up," Bronson said.

"Come in," Russell said.

They stepped inside. Russell ran up the stairs.

"I'll get dressed and be down in a minute," he said.

They stood in the hall till he returned. He asked no immediate questions but sped down the hall to his den. They heard him put in a call for the despatchers' office.

Presently he began to talk in rapid, even tones:

"Hold Sixty-Six at Brighton till further orders. Don't let anything pass Torrey after 1.30 o'clock either way. Have a special made up of an engine and a caboose. Give her a clear track from here to Torrey. Put everything in for her. I've got to be at Torrey at two o'clock."

He hung up the receiver and came into the hall.

"You fellows both armed?" he asked.

They said they were.

"Good enough," said Russell. "Come along. I'll get some men at the yards."

He put his hand on the knob to open the door. There was the sound of some one running down the stairs. The three of them turned. Bronson stared when he saw young Baker, Hazel's brother, coming toward him. The boy clattered down and stood in front of Russell.

"I heard you on the phone," he said. "I'm going, too. Give me a gun."

Russell searched his face for a moment.

"There's an extra one in my desk," he said then. "Get it. Hurry. We have no time to lose."

The boy ran into Russell's den and emerged almost at once. Bronson, at this time of crisis, forebore to ask any questions of him or about him.

In the sheriff's machine the party sped to the station. They went up into the despatchers' office and Russell called for what men he could get—two from the roundhouse and three from the yard crew.

For a moment Bronson found himself standing beside Baker, a little withdrawn from the others.

"How did you get back here?" Bronson asked. "What were you doing at Russell's."

"I've been sick," Baker answered. "When you sent me away, I went to Chicago. I had some money, but on the train I fell in with a couple of guys and they fleeced me. I thought I was clever, but I wasn't clever enough.

"In Chicago they wanted me to work for them after I'd told them what I'd done for Luke. I didn't want to take the job, but I was desperate. I was without money, and you wouldn't let me come to my sisters."

Bitterness filled his voice.

"You were rough on me, Bronson. You didn't understand, and you didn't give me any show. I worked for these two fellows one night, and I was arrested. But they didn't put it on me, and the judge let me go.

"But that night in jail I thought I was going crazy. It was awful to be shut back of bars like that. Those bars seemed to be pressing in on me. It seemed as if I couldn't stand it.

"I swore then that if I ever got out,

I'd run straight, no matter what anybody did to me—you or Crocker or anybody else."

Bronson looked down at him. The recollection of his night in jail had robbed the boy of what little color he had had. Bronson saw that there were deep shadows beneath his eyes—eyes which were so like Hazel's. His weak mouth quivered.

"You don't class me with Crocker, do you?" Bronson asked.

"Oh, I don't know," Baker answered. "If you had left me alone, I might have worked out of things all right. But I blame Crocker most. He began teaching me things when I was only a kid—when he was courting my sister, even.

"It was he that made me to go work for Luke back home, and it was he who started me here again. He was a brute. You know that. Any man that would strike a women like my sister— Well, I'm glad somebody killed him. I was always afraid of him."

"Who killed Crocker?" Bronson put in. "Were you in on it?"

The boy gave him a wide-eyed look.

"I? I was *afraid* of him," he said simply. "I wouldn't kill anybody."

"How did you happen to be at Russell's?" Bronson asked, hoping to surprise something out of the boy by abruptly shifting the line of questioning.

"I didn't happen to be there," Baker answered. "Russell is one good man. He'd do anything for me or Hazel—or my sister, Alice. Probably he'll marry her now that that brute is dead. He ought to. He's loved her long enough and never went near her because the world held a man like Crocker.

"That's the way Russell plays the game. He kept Crocker on his job in spite of reports about Crocker, and he never tried to steal Crocker's wife away from him. So when I came back here, I went to him."

He lifted his head with a little, proud gesture that Bronson had never seen him use before.

"I didn't want to go to Russell. He's had worry and heartache enough. Maybe that's why he's so human. But I was sick and busted.

"He took me in without any question. I been there for several days. He'll give me a job on the road again when I get well. I'll run straight now, since Crocker is out of the way."

He paused. The voice of the despatcher came to Bronson.

"Your train will be here in five minutes, Mr. Russell. You'll be due at Torrey at 1.55."

Russell turned about.

"Come along, boys," he said.

They went down to the station platform. It was raining steadily now, but not violently. The lightning had quickened and came more regularly.

In a few minutes a headlight showed down the track. The train crept up to the station and stopped. Russell got into the engine.

"You and the sheriff get into the caboose with the rest of the men, Bronson," he said.

When they got into the caboose, Bronson sat down beside Baker.

"You weren't in on the car robberies, were you, son?" Bronson asked.

"I wasn't in on them exactly," Baker answered. "Crocker used to make me keep him informed about train movements if there was anything doing. Sometimes he'd call me up half a dozen times in a night. When he'd been drinking, he used to boast about it considerably. He said he was going to get rich. Where are we bound for to-night?"

"They're pulling something off at Torrey. Planning to hold up Sixty-Six."

"That's what Crocker meant when he said there'd be a big haul some night and then we wouldn't have to work any more. He promised to take care of me, but I knew he was a liar. I didn't want him to take care of me. I just wanted him to leave me alone."

"D'you think the gang bumped Crocker off so they wouldn't have to cut with him?" asked Bronson.

"How do I know? Your guess is as good as mine."

Baker's answer came in a curt tone. The boy lapsed abruptly into a brooding silence and sat with his head on his breast. Bronson put no further questions to him. Bronson was soberer than he had ever been in his life before and a little sad. He saw now that he might have helped Hazel's brother if he had gone about it in the right spirit. He resolved to help him in the future if he could.

While they had talked, the light train had gathered speed. Bronson looked at his watch. It showed twelve-thirty. He saw that they would have plenty of time to make Torrey by 1.55.

They rattled over frogs and crossings with undiminished speed. Freight-trains, and once a north bound passenger, showed on sidings as they flitted by. They swept round curves and scampered over the straightaways.

At last without a warning whistle the train began to slow down. It slid to a stop.

"Come on," said Bronson to the other men and the sheriff.

They went to the platform and stepped down. Russell descended from the engine and came toward them. Bronson looked about him. There was nothing to be seen except the woods and the fields which Luke had described. In the intermittent lightning flashes the fields looked sodden and moisture dripped down from the tall trees.

"Hexter will back to Webster against a flag," Russell said. "I don't want an engine here. It might rouse their suspicions. As soon as he is gone, we'll go up the track and wait.

"I figure the gang will try to wreck Sixty-Six about here, but I want two of the switchmen to patrol the track from here to beyond the Torrey shanty. Get them started, Bronson. Tell 'em to keep close to the fence and move with caution, so that they won't be seen. If they come upon anybody, tell them to come back and let us know."

Bronson got the two men started, and they disappeared, moving shadows in the dark. Because of the tall grass along the fence the lightning failed to pick them out.

The rest of the party crouched against the fence on the other side of the track. Beyond them on a sharply rising hill there was a clump of trees. The darkness there was intense.

For almost an hour they crouched in silence. Bronson held his watch in his hand, his eyes on the dial. The first flare of lightning showed him it was now ten minutes to three. He wondered if Luke had given them a false clue. If the men expected to take up a rail or plant a charge of dynamite by three o'clock, they would have to be getting about it.

He slipped his watch back into his pocket. Then he was aware that something was in motion along the track. He could not discern what it was. But he was sure there was motion there in the black night.

The lightning flared again. He saw that half a dozen men, walking closely together, their heads bent against the rain, were coming toward the hidden party.

There was silence for a moment and then the sound of metal striking metal. Russell rose at Bronson's side.

"Come on, men," Russell said in a husky whisper. "Shoot if they don't yield at the first command. Take no chances. Keep out of sight till we get opposite them."

They crept along the fence. The other group began to stand out a little as they crept closer. They came opposite them, not twenty feet from them.

"Get ready," Russell whispered.

There was a faint click, and a path of light shot out toward the men from the tubular lamp which Russell held in his hand. The light wavered for a moment and then focused itself on the shoulders and faces of the men. Bronson saw that Fordney was not among them.

"Put up your hands," Russell said steadily. "There are eight of us here.

We are all armed. We'll shoot the first man that moves."

All but one of the men raised their hands above their heads. There was the sound of metal striking metal again. One of the faces went out of the circle of light. Russell moved the tube and picked up the man as he ran.

The sheriff's gun spoke. The man's hands went above his head, involuntarily now, and he pitched forward on his face. The light came back to the others. That quick and certain shot had held them motionless.

"You fellows surround them as I move toward them," Russell directed. "Get their weapons."

Bronson strode forward. Baker was at his side. They went through the men and took their guns from them.

"All right," Bronson said

"Now, you fellows line up and we'll take you down to the engine," Russell said. "We can come back and get that other one. Move sharp."

The men obeyed without a word. The others fell in behind them. Bronson and Baker were the last. Baker was at Bronson's left.

The procession started to move. Russell stood to one side to bring up the rear. The party moved beyond the circle of the light. The light played off into the grass at Bronson's right.

Suddenly a wild cry broke from Baker's lips. He seized Bronson by the arm and pulled himself around Bronson. His body shielded the engineer.

His eyes stared into the grass. His frozen lips tried to explain but no words came.

The astonished Russell turned his light on the boy's face. In the same breath there was a pistol-shot from the point at which Baker had been staring.

"Ah," the boy said, and his hand went groping to his breast.

As Bronson clasped him in his arms and let him gently to the ground, the sheriff's thirty-eight answered the shot which had reached the boy. A choked cough was the answer out of the dark. The sheriff seized Russell's tube and ran in the direction of the sound. He was back in a moment.

"I've killed that skunk Fordney," he said.

CHAPTER XIV.

DEATH AND VICTORY.

"FORDNEY?" Russell said. "Was he in this?"

"He was the boss," the sheriff said "But let's take care of the lad."

They bent above the kneeling Bronson and looked down at Baker. His face was gray and there was a widening stain on the front of his shirt. As they looked he opened his eyes.

"Ah," he said, "I'm done for."

He rested a moment and then he went on more clearly.

"You fellows go away. I want to speak to Bronson for a minute. Get back out of hearing. Leave your light here, Mr. Russell."

He smiled wanly.

"I'm much obliged to you for what you did for me, Mr. Russell. I wish I'd gone to you in the first place, but I didn't like to trouble you any more than you were being troubled. You're the whitest man I ever knew."

Russell bent and pressed the boy's hand. Then he withdrew, leaving his tube and taking the others with him.

"They can't hear, can they, Bronson?" Baker asked

"No," Bronson said huskily.

"My sister—my older sister—and I were a good deal alike, Bronson," Baker said. "We thought an awful lot of each other. She was like a mother to me. You know, we lost our mother when we were all kids and our father soon afterward. My sister worked for me and Hazel and looked after us till we got so we could work ourselves. Then she met Crocker.

"Crocker was younger then and he had a kind of a dashing way about him. I guess he lightened things up for my sister.

She had been through a lot and she had got to look older than she was.

"But in a month after meeting Crocker, she was prettier than she had ever been. Hazel and I were glad that she was going to get a little happiness.

"She married Crocker in a couple of months and they came here to live. It didn't take my sister long to find out that she had made a big mistake. Crocker was—he was the limit. Anybody that'd strike as good a girl as my sister!

"Once he struck her in front of me. That was when he had got me on the hummer by making a steerer out of me. I put a gun on him and told him he had only five minutes to live. I was seeing red, like they say. But he only laughed me down.

"I wish I had had the nerve! It would have saved my sister a good many blows and a lot of worry. But I never did have much nerve. I guess I've never been much more of a man than either of my sisters. I used to look at you, Bronson, and wish I had your grit and your strength."

"You're a better man than I am, son," Bronson whispered. "You saved my life just now."

"And lost my own," Baker whispered back. "I can feel it coming. It doesn't hurt any. I feel more rested than I've felt in a long time. Well, everything's been pretty much of a jumble.

"When you took Crocker to your house, you had his nerve for a while, and he confessed a lot of things to you, enough to give you a start. But the night he was killed he got his nerve back.

"He bribed your landlady to bring a note to me at Russell's. That servant at Russell's has been working for him and Fordney. You want to tell Russell about that. I guess Russell will think there isn't anybody left by the time he gets the whole list of those that were throwing him down.

"In his note Crocker said he had reformed and was at your house. I thought if he really was at your house he had reformed. I never thought but what you were on the square, Bronson. So I went along with the landlady. She said you were out.

"I went up to your room where Crocker was. Instead of being reformed he was worse than ever. He started to bully me right off the reel. He took a gun from under his pillow. He said he had got the landlady to buy it for him.

"'You take that gun and go out and kill Fordney,' he said. 'I was slugged by somebody Fordney hired, and like a fool I let that guy Bronson bring me here. They got a confession out of me. I didn't tell them everything. I didn't tell them about Fordney.

"'While Fordney is alive, I'm between Bronson and the sheriff on one hand and Fordney on the other. Even if I go free, I'll never be able to show my face while Fordney lives. I thought if I covered him in my confession, I'd be safe from him, but I see that's a mistake. Suspicion will attach to Fordney finally and then he'll get me. You go kill him.'

"I thought of that night in jail. I didn't believe I could kill Fordney and get away with it. Anyway I didn't want to kill him. I backed across the room to the washstand and put my hand out to steady myself. I caught hold of a heavy towel.

"I told Crocker I wouldn't do what he said. He began to curse and started to get up. I pulled down the towel, wrapped it around the gun, and jumped for him. I shot him just as he was sitting up. Where's that light, Bronson?"

Bronson held the light closer and raised the boy. With no more than a sigh issuing from his lips he went limp in Bronson's arms.

"Oh, men!" Bronson called.

The sheriff and Russell came to him.

"He is dead," Bronson said.

"Did he tell you anything important, Bronson?" the sheriff asked.

"He said he had come back to be square," Bronson replied. He looked the sheriff in the eyes in the light from the

flash lamp. "That was all he had to say, sheriff."

The sun was coming up over the horizon when Bronson went up the steps of the county jail. He asked for Mrs. Sparks. The woman came.

"Your husband has been detained at the station," he told her. "He told me to tell you. He is all right and will be home soon. May I see my wife?"

Mrs. Sparks nodded. She left the room, closing the door after her. A little later the door was pushed ajar slowly. Hazel came in, closing it after her. Her eyes were tired.

"Ah," she said, "you've come home at last." She moved across the room to him. He took her in his arms but he did not offer to kiss her.

"Hazel," he said, "I've come with bad news. I have loved you—I do now but it seems as if I only cause you unhappiness. Your brother went with us tonight. He has been at Russell's for several days. Russell has been taking care of him."

He felt her shiver in his arms.

"Where is my brother now?"

"He is at home with your sister by now," he answered. "Russell was taking him there." His arms tightened about her.

"Hazel, your brother saved my life."

She searched his eyes, and then she suddenly understood.

"And gave his own," she whispered.

"And gave his own."

There was a space of silence when she cried a little on his breast. At last she looked up and again she searched his eyes. She saw that the old flame of unrest had gone out of them. It had given place to a steady glow of courage and resolution. A weaker man, dying, had given strength to one whom men had always called strong.

"Dear," the girl said, "my brother did some good, didn't he?"

"I said he was a better man than I am," Bronson returned. "And I say it now."

She raised her lips. He touched them gently with his own.

(The End.)

STRAIGHT DOPE.

BY J. E. CHRISMAN.

THERE'S never a day but what some jay
Bursts forth in song and story
Of the eagle eye and the tallow-pot
And the con in all his glory;
The engine wipe and the section snipe,
And the train-despatcher weary;
The youthful op and the railroad cop,
And the Pullman porter cheery.

THEY'RE heroes all, if you only fall
For the bunk these guys would hand us;
But take it from me, just between us three,
They don't quite understand us.
We hit the ball and give our all,
Whether car toad or brass collar;
It's not for fame we play the game,
But for the mighty dollar.

On the Editorial Carpet

Where We Gather in the Hut, Tell Our Troubles, Help One Another, and Sing Some Old Songs.

HERE'S hoping I can muffle my laughter long enough to tell you about next month's novelette—a new *Hiram* story by Charles W. Tyler. Oh, *Hiram*, you Aroostook wonder, you, you'll be the death of us yet, what with your antics and the amusing facility with which you get into trouble, and the side-splitting ingenuity with which you get out again. This time it's—

"HIRAM" BOOMERS INTO MEX.

BY CHARLES W. TYLER,

Author of "Hiram on a 'Baching' Job," "Hiram in a Hold-Up," "Hiram Goes West," "Hiram on Broadway," "Hiram on a Down-Hill Road," etc.

HIRAM, the brass-pounding, railroading joke, says:

"It ain't my intention to ever give Jane Opportunity the corner stand, neither do I expect that I shall loaf around in any shady lane waitin' for *her* for any extended length of time.

There ain't nothin' worse in this world than to get into a rut. If I ever get into one, it will be somewheres in the neighborhood of six foot deep, and friends are requested to omit flowers.

A lot of folks will tell you that Hiram is a direct connected, one-speed bullhead. That may all be, but I won't never get stripped shiftin' gears—gettin' my transmission junked because I can't stand high after bein' run on low all my life.

Ever since I took a job working my passage out of Aroostook—firin' a salamander in a car of spuds, Presque Isle to Boston—I've been climbin' into the ring with old lady Experience's oldest boy, and getting a whale of a trimmin', and then limpin' out all bunged to blazes. Sometimes when a square peg gets into a round hole tight enough, it takes a lot of hard knocks to get it out again.

That's me—*Hiram!* from the Aroostook potater belt."

Whether "Hiram Boomers into Mex" qualifies as a railroad novel I'll leave to your vote next month, when you will get it complete. Certainly it is about a railroad man, by a railroad author, and told in railroadese. You'll enjoy it, that's sure!

"THE United States government," states Marlen Pew, "is the second largest individual customer of the railroads. The revenues obtained from the carriage of mail-matter, though less than those obtained from the express companies, form an important feature of railroad prosperity. Due to the advent of the parcel-post, the volume of postal material is increasing by leaps and bounds."

We quote the opening sentences of Mr. Pew's absorbing "Story of the Mails," which you will find in next month's magazine, illustrated with many half-tone engravings.

JUDGING from the office correspondence, there is a heap of interest in the new railroad which your Uncle Sam is building in Alaska. Samuel H. Paine has written us a contribution which, so far as we know, is the

most thorough and, at the same time, interesting article on this subject that has yet appeared. Lots of illustrations.

BRASS-POUNDERS, halt, salute, and give the high-sign to the boss reminiscer of old times in the telegraph business—"J. E. M." Part three of his sparkling recollections, "Old Times in Morse Shops," next month. You know "J. E. M.," boys! The next one is going to be *good*.

"TALES from the Knights of the Railroad Round-Table" will be unusualy snappy next month. A group of old rehables—Frank Kavanaugh, Owen Hugh O'Neil, Charles S. Given, practical railroaders all three—will spin some of their best yarns.

THE RAILROADER'S MAIL-BAG.

FOLLOWING the publication of Oliver Roberts's fascinating article, "Wells Fargo's Shotgun Era," Mr. D. Colt Egan, of Berkeley, California, wrote in to say that "Old Bodie," after whom the town of Bodie was named, still lived, a familiar character to the inhabitants of Yosemite National Park. The town of Bodie, it will be recalled, was the scene of many important occurrences mentioned in Mr. Roberts's article.

We printed Mr. Egan's letter in the "Mail Bag" for April. It immediately called forth a number of communications informing us that Mr. Egan was in error. Here, for instance, is a note from Mr. Roberts himself; and we are glad to observe that he takes occasion, at the same time, to favor us with a few more of his entertaining reminiscences:

The real Old Bodie was an old man in 1850, and, I believe, died during the fifties. One thing that I am positive of is that during these years some placer mining was done in the ravines and cañons about the camp of Bodie by a man who had that name, and from whom the camp got its name.

This man Bodie died of exposure. The snow is at times forty feet deep on this mountain, and the thermometer goes away below zero. There is an atmospheric disturbance thereabout called pogonip—a sort of frozen fog. The Indians always go to their tepees and lie on their faces during a spell of pogonip. White men face it, and many die.

In the year 1876-7, the quartz miner found the gold ledges from which came the placer gold that Bodie and others had washed out years before. Tons of it were mined from these ledges, tons of it milled, and tons of it stolen by the miners.

Many a heavy trunk left Bodie by Ogg's fast freight and no express messenger!

A ton of pure gold is worth $602,927.32. Bodie gold, on account of the silver in it, was worth about $11 per ounce. Pure gold is worth $20.67 per ounce; so one can form an idea what express messengers had to care for.

Often the bullion was taken out of Bodie by daylight on a three-seated buckboard with four horses going at top speed through the cañon between Bodie, California, and Aurora, Nevada, twelve miles away. At Aurora the bullion was put in a vault.

The regular stage left Bodie at about 7.30 or 8 P.M. No one ever saw any bullion put in the stage. A small blue box marked Wells Fargo and Company Express was put in the boot the last thing. Just before the stage pulled out, this box was locked to the vehicle by means of a small chain put through the handle. Then a lone messenger climbed on, and the trip to Aurora was started. The "Swing Team" of six horses—Tom Petit, driver—made the run in an hour.

At Aurora the passengers were told to get out, get warm, eat supper, and make ready for the hundred-mile run to Carson City, Nevada. While the passengers were preparing for this jaunt, the bars of bullion were being distributed under the seats of the Concord stage.

This the passengers knew nothing about. Then, when everything was ready, the long-distance driver came around to the stage-office. Here the stage-agent came out with the passenger list to seat and place the passengers. No strangers were put in the back seat; they were generally seated in front with their backs to the horses. As soon as the passengers were all in, two men would get inside and take their places on the end seats, each with a cut-off shotgun poked through the curtain-flap of the side door.

Three more armed men climbed on top Some freshy, or new fellow, traveling was always likely to say:

"What's this? What's going to be pulled off? I'm not going to sit here and be shot at"

Thereupon Mr. Freshy might be "accidentally" punched in the ribs with the butt end of a shotgun, but he got no other answer

With everybody all set, the six horses would start off on the jump, the silk at the end of the lash cracking over their heads.

The chances are that no one had noticed the lone horseman, with concealed rifle, leaving Aurora just a little before the stage got off Well, this was Mike Lovey. Mike used to go as a sort-of scout down the road ten miles to the junction at Bellville, where he would leave the saddle and board the stage upon its arrival From Bellville the stage would spin along peacefully enough. The conveyance was timed to arrive at Carson City, Nevada, between noon and 2 P.M., several changes of horses having been made *en route*

Some of the bullion stayed at the Carson mint, and some went on by the Virginia and Truckee Railroad to Reno, then *via* the Southern Pacific to the San Francisco mint. The messengers on this run were generally Mike Lovey, A. G. Ross, H C. Ward, Tommy Brow, Johnny Brent, Jack Roberts, and Jack Massey. After his experiences around Bodie, Massey was employed as a guard at San Quentin, finally being found dead at the gate.

Johnny Thatcher once was one of the messengers, but later became *the real* detective for the Wells Fargo Express. Now, it must be remembered that a run with that many messengers was not an every-few-minutes' occurrence. The messengers, however, were under pay—$125 per month all the time, whether in active service or not

While Bodie was a hot hole of excitement, with its one or two men for breakfast and the pot boiling faster and faster, there came a period in the fall and winter of 1878 when the pogonip was thick. The fact that there were no spare beds in the town led to a new graft upon the part of the tramps and check guerrillas and toughs. These fellows made for the chairs in the saloons about 4 P.M. Generally before midnight some traveler, who had left his sleeper at Reno, Nevada, would come in, sorefooted, tired, and leg-weary from his vain hunt for a bed, and would pay anywhere from one dollar to five dollars for the hobo's seat

Soon he would be asleep, whereupon the bartender would yell.

"Here, you, feller! Get out; no sleeping allowed here. Keep awake and buy"

Well, with these conditions many got pneumonia, and generally in twenty four hours were where the cold and pogonip do not exist. It was no rare occurrence to see old Tom Keefe or Broken-Nose Bob Cameron come up the main street with a corpse thrown over his shoulders, taking it to the undertaking parlors (an open carpenter shop).

For a few months, say, from January to April, some days there would be as many as sixteen funerals. We sort of got the habit of going to funerals, and on the days when there wouldn't be any procession at all up the main street or sidewalk, we'd actually miss the function. One spring, at about this period, when the snow was melting fast, some one came in and announced that his party had found the remains of Old Bodie over in a ravine which they were prospecting

There was now real excitement. We planned to have a great, big funeral, for here was "some one worth while" following to his last resting-place. So the messengers got in line for a little walk, and a collection was taken to buy a lot and a monument and a "sure good" coffin with bright silver handles. An express-wagon was hired to bring in the body. We were all mourners, and nearly everybody had a flask of whisky to celebrate this event.

A day was set—I think in the early part of May—to go and take up Bodie's remains. We went in a long procession of gamblers, miners, and dealers in both dry and wet groceries. I mention the gamblers first, because in those days they were always first to spend money and time doing the act of the good Samaritan

Well, we got to the spot where they said Bodie was buried, dug a hole in the side of the hill, and unearthed an old miner's shoe, in which were the foot and two bones; the other parts of the body had decomposed. This old shoe was placed in the coffin and, with great respect and solemnity, was borne off to the grave, where it was buried and a monument placed over it I attended the funeral myself Everybody knew that Old Bodie had died, so that if this Yosemite Bodie mentioned by Mr D Colt Egan in the April RAILROAD MAN'S MAGAZINE is the discoverer of the Bodie mining-camp, he must now surely be old, yea, about one hundred and thirty-seven years of age; and at that age should know all the trails from Obsidion Mountains as well as all the Hot Springs that washed in Mono Lake

OLIVER ROBERTS

The former editor of a Bodie newspaper—or the editor of a former Bodie newspaper, have it your own way—also was kind enough to write us about the career of the man from whom the famous mining-town derived its name.

In the April issue of your magazine, D Colt Egan states that a familiar character

of the Yosemite is called "Old Bodie," and that he had "been told" that this man was the founder of the famous old mining-camp of that name. The man for whom the camp was named has been dead many years; his remains are buried on the hill-side above the old country hospital at Bodie, and a monument marks his last resting-place.

His name was William Body—the "y" having the long sound of "e." He and a companion were the discoverers of what afterward became the celebrated Standard Mine.

He did not live to see the place grow either prosperous or famous, but got lost in a snowstorm and perished. This is known to all the old timers, and was published in a history of the old camp, compiled shortly after his demise.

JAMES E. NUGENT.

Crockett, California.

P. S.—If the above is of any interest, you are at liberty to publish it. I lived for many years in Bodie, know its people, its mines, its history, and a thousand facts and incidents of interest.

I published the last paper ever printed in the old camp, the *Bodie Miner*, and killed it off with the last issue of November, 1910.

The Bodie discussion likewise brings this interesting letter from a former cowboy:

In your April issue of this good year of Our Lord, 1917, there is a communication from a Mr. D. Colt Egan, in which he refers to a character known as Bodie. A paragraph therein particularly attracted my attention. He mentions the fact that a certain town in the region of the Yosemite was once a hornets' nest.

I have followed the occupation of cowboy in the days when the cowman was lord and king and the farmer had not as yet come to put us rangers in the position of *Othello*, with "our occupation gone." I am a pioneer of this State; have had the honor of occupying a place in the skirmish line of civilization away out here on the roof of the continent. And I can remember the days when this particular section would make a hornets' nest be mistaken for a pink tea of sweet girl graduates.

We had a little private border war for a couple of years with a gang of outlaws, the best organized and most powerful band of cutthroats and pirates that the annals of the West can show. I was, of course—being Irish and therefore of a placid and peaceable disposition—in the most of the little trouble.

I was one of a posse of seven who, in 1894, on election night, rode thirty miles to the relief of a settlement that had been raided by the gang aforesaid. And we made the ride in record time of one hour and forty-nine minutes. It may interest you to know that in file with me and leading the column, was a man who is believed by everybody out here—the locale of Owen Wester's *Virginian*—to have been the original of that character.

JOSEPH MAGILL.

Crosby, Wyoming.

FROM A SOLDIER.

GLAD to hear from you, comrade; and gladder still to know that the boys in the trenches enjoy the RAILROAD MAN'S MAGAZINE.

I am just writing a few words of appreciation in regard to your book. I am not a regular subscriber to your magazine, having just been discharged from the Canadian Expeditionary army forces after eighteen months' service.

I have taken the RAILROAD MAN'S MAGAZINE for the last two years. I had it sent overseas to me every month, and it has passed many a weary hour away.

I have never been a railroader myself, and I guess I never will be now, as I have lost the sight of one eye; but I am greatly interested in anything about the railroad. There is only one fault about it, as far as I can see, and that is I would like to see more tales of the Canadian roads. I am sure there must be lots of old-timers of the C. P., G. T., and C. N. R. amongst your readers.

R. LUCAS.

644 Richmond Street, West,
Toronto, Ontario, Canada.

FLASHES FROM OUR READERS.

I read your magazine with much interest, as I was for six and a half years an engineering pupil under the late Alexander J. Cassatt at Altoona when he was superintendent of motive-power and machinery there for the Pennsylvania Railroad, and I had the pleasure of visiting Altoona in 1901 and again last year.

WILSON WORSDELL.

The Glebe, South Ascot,
Berks, England.

Say, can't you work in some more stories by Ethel and James Dorrance? "The Trouble-

Shooter" was one of the best I have ever read. Also more of C. W Tyler's stories. They are fine, and I am willing to bet that the one coming next month is great

And please don't forget *Jones*, the boomer. I have laughed until I cried over some of those stories, and now I have taken to cutting them out and saving them to read again

Although I do not subscribe to the RAILROAD MAN'S MAGAZINE, I have been a news-stand reader for over a year, and would not miss a copy for the world itself with a little gold fence around it. R WOLCOTT.

64 Edgewood Avenue,
New Haven, Connecticut

Your article in March on the origin and history of the express business is very interesting. Is there not an omission of one important name —that of Butterfield, of Utica, New York?

He had interests in that city, and the best hotel for many years bore his name. The people of Utica claim that Butterfield first tried the plan of a Northwest express. That not being fully successful, Wells and Fargo took over the business.

READER

Pinebluff, North Carolina

Enclosed please find one dollar, for which please enter me as a subscriber to your RAILROAD MAN'S MAGAZINE for one year

I have read this magazine for nearly a year, and am sorry I hadn't heard of it before. I always purchased my copy at the news-stand, but in order to be sure of my copy I decided to subscribe for it. Please begin my year with the March number of "the book of pleasant hours."

DEAN HOELZLE.

3 Pennsylvania Avenue,
Sharon, Pennsylvania

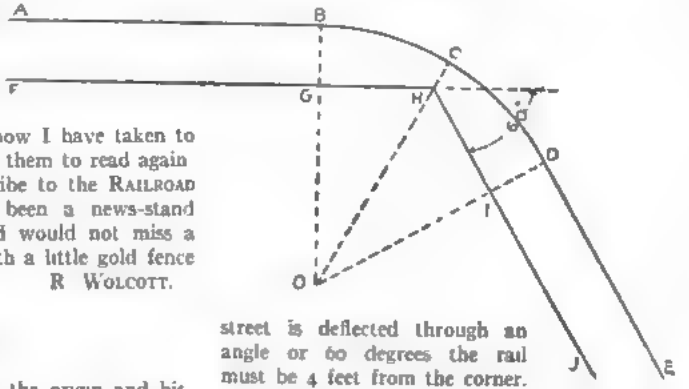
SOLUTION TO BELL'S PROBLEM.

THE April issue contained a speed problem, contributed by Harry M Bell, of Massena, New York. The answer is that the train's previous speed was 30 miles, and the total distance it ran was 90 miles. This solution was sent in by W. G. King, engineer, Del Rio, Texas, D A. Bull, Standard Bank of Canada, Bloomfield, Ontario; W. J. Ross, Summerland, British Columbia, and others

BRAIN-TEASERS AHOY!

ENCOURAGED by the publication of my first problem, I am sending another and more difficult problem:

A street railway-track is 10 feet from the curbstone, and in passing a corner where the



street is deflected through an angle of 60 degrees the rail must be 4 feet from the corner.

I make the answer 48.69 plus feet and have checked within .005

A. B DE LISLE.

1678 Howard Street,
San Francisco, California.

ADDRESSES WANTED.

Readers of the RAILROAD MAN'S MAGAZINE *who make requests to locate missing relatives through these columns must abide by the following:*

All requests must be written in ink and a complete description of the missing persons given, as well as full name and age.

We will not publish these notices unless they are signed by the nearest living relative of the missing person, and we must be assured that every effort has been made to locate him through the various brotherhoods or associations to which he might belong

The person making the request must also give his or her complete address.

INFORMATION is wanted of the whereabouts of Asbil Harry Ford, dark complexion, height about 6 feet 2 inches; weight about 190 pounds; age 24. He was last heard of in 1913, working as a telegraph operator for the C., B & Q. R. R. at Council Bluffs, Iowa. Any information concerning him will be appreciated by his brother, FRED FORD, 354 West Cedar Street, Akron, Ohio

INFORMATION is wanted of the whereabouts of Allen Randolph, 5 feet 9 inches in height; light hair; blue eyes. When last heard of, three years ago, he was in Stockton, California. He must be on some railroad in the South. Any information concerning him will be greatly appreciated by AL GROSS, Clyde, Washington

SONGS BY BARDS OF THE RAIL.

THE ROCK-CANDY MOUNTAINS.

(Reprinted by request. Transcript by kindness of W. Wilson, 125 Forest Avenue, Avondale, Cincinnati, Ohio.)

ON a sunny day in the month of May
A hobo he came hiking
He came to a tree, and "Oh," said he,
"This is just to my liking."
In the very same month, and the very same day,
A farmer's son came hiking.
Said the bum to the son, "Oh, will you come
To the big Rock-Candy Mountains?

CHORUS:

"I will show you the bees,
And the cigarette-trees,
And the soda-water fountains;
The lemonade springs, where the bluebird sings,
In the big Rock-Candy Mountains."

So they started away; on that very same day
The mile-posts they were counting.
But they never arrived at the lemonade tide
Or the big Rock Candy Mountains.

The punk rolled up his big blue eyes,
And he said to the hobo, "Sandy,
I've hiked and hiked this whole day long,
But I haven't seen no candy
I've hiked and hiked till my feet are sore,
So I'll be doggoned if I'll hike any more.
I'll be a home guard with a lemonade card,
At the big Rock Candy Mountains."

FINISH THIS.

THE engineer, a mighty man with grease upon his nose,
Was crawling underneath the trucks, a soilin' up his clothes,
To oil his throbbing engine with a piece of garden hose,
When sauntered up a fireboy, a goodly man and true,
And spun this yarn as I in turn am spinning unto you:
'Twas many years ago when he and Bill, the engineer,
First rambled up and down along upon these rails,
With Bill behind the throttle of a bunch of scrap and nails;
And me a feeding paper-waste, and now and then a coal,
And all the while a keeping of my finger in the hole
To keep the steam from spurting through where she had sprung a leak,
And Bill so busy likewise he couldn't stop to speak.
So when we got a message to move an empty car
That was standing on a siding that wasn't very far,
Old Bill got out his monkey-wrench and bolted on his clamps,
While I patched up the biggest holes with cancelled postage stamps.

I wonder who of your readers can finish this.

Parsons, West Virginia. H. I. SHIELDS.

A TRIP WITH OLD DAN.

HE climbed up in the engine cab,
His water-jug in hand,
A cheap cigar between his lips—
The three-for-five-cent brand
He looked at his fire; 'twas very low—
Much lower than should be;
But what re'lly made him sick at heart
Was to fire for old Dan C——.
"Oh, how I hate that durned old crab,
A trip with him is torment."
For how old Dan misused the boys
He'd heard so many lament
Then, lo, behold! A face appeared!
'Twas the trouble-finding Dan.
"Good evening, lad," with a smile he said,
As he reached for his oil-can
"Here, have a smoke," his next words were.
He offered a cigar. "Take two or three;
We'll have some more. We're not going very far."
They took a siding there at ——,
And got down on the grass
To take a rest and eat a lunch,
And let the flyer pass.
"Don't eat those nasty sardines, lad,"
He muttered with an oath
"Here, have some chicken sandwiches,
I've brought enough for both
Now take a nap, I'll watch the fire
And pull you down some coal."
The fireman sat and took the rest,
He heard the flyer roll;
He sat and thought, then thought some more,
How nice old Dan did seem.
Then yawned and stretched, fell out of bed—
The trip was but a dream.

—DAN C. LAUGHLIN, in *Locomotive Firemen and Enginemen's Magazine.*

ONCE IN EVERY MAN'S LIFE

The express messenger's story

THE EXPRESS MESSENGER'S STORY

is as old as the history of railroading and needs no retelling here. Details may differ, but the essential features remain the same. Only when the messenger is caught unawares, or unprepared, does the story become more than—just an incident in a day's work. The picture preaches a lesson on preparedness.

The COLT can be discharged only when the trigger is *purposely* pulled.

The COLT is automatically safe—mechanically certain in use or disuse; the quickest to get into action, obeying instantly the pressure of your finger on the trigger.

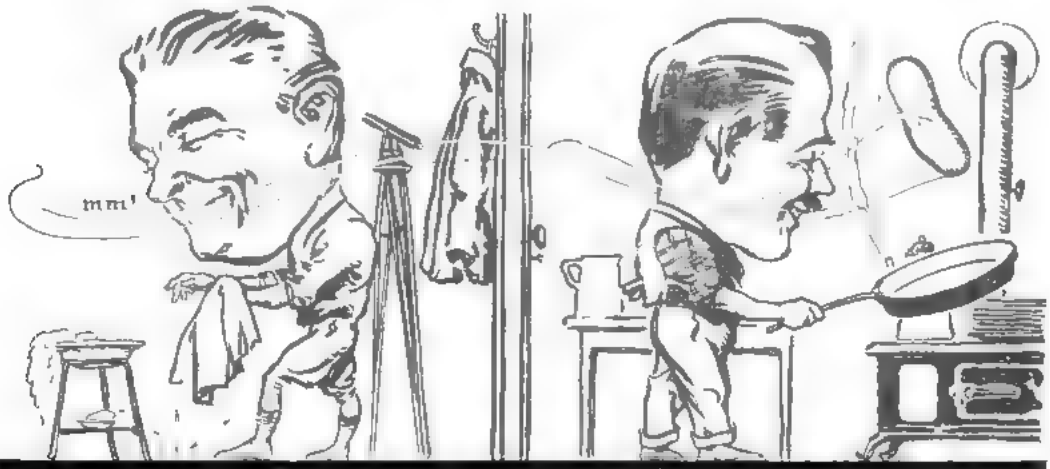
Covered with a COLT, the criminal hesitates to take the "gambler's chance."

COLTS are made in 15 different models; calibers .22 to 45 therefore there's a COLT for YOUR special needs See a COLT at your Dealers, or write for Catalog No. 97 and booklet "How to Shoot."

"You can't forget to make a COLT safe."

COLT'S PATENT FIRE ARMS MFG. COMPANY

Hartford, Conn.



HOW do you know the flapjacks are ready?

"Your Nose Knows"

There's a hot griddle *fragrance* in the air that gets you—puts an edge on your appetite—promises you something you like hurries you up. Just as the *pure fragrance* of a good tobacco gets you, quickens you with its promise of certain satisfaction. For *pure fragrance* never misleads—"Your Nose Knows."

***Pure fragrance* is the essence of**

Tuxedo

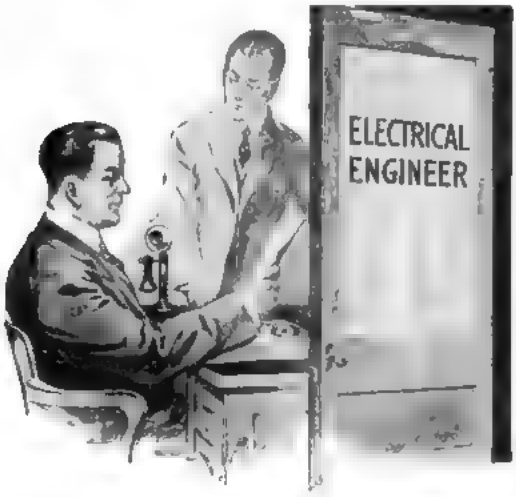
The Perfect Tobacco for Pipe and Cigarette

Because it is an expert blending of tender, ripe Burley the most *fragrant* leaves of the tobacco plant grown in the sunny Blue Grass section of Old Kentucky. There is no *fragrance* like it—"Your Nose Knows."

Try this Test: Rub a little Tuxedo briskly in the palm of your hand to bring out its full aroma. Then smell it deep—its delicious *pure fragrance* will convince you. Try this test with any other tobacco and we will let Tuxedo stand or fall on your judgment—

"Your Nose Knows"

Guaranteed by
The American Tobacco Co.



The Electrical Engineer Is the Man of the Hour and the Future!

EVERYWHERE electricity is now being used for power, light and heat. All other agents are out of date. Nevertheless, Thomas A Edison says that we have only begun to realize the tremendous possibilities in the field of electricity. Golden opportunities await the Electrical Engineer. His work is fascinating—and big salaries are paid. The Electrical Engineer is the man of the hour and the world pays him accordingly.

$2,500 to $5,000 a Year

That's an ordinary salary for an Electrical Engineer. All over the civilized world men with a thorough knowledge of electricity are in demand and naming their own salaries. And the training that you need to put you in one of these positions can be obtained right in your own home.

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Neōlin

And the Wear and Foot-Relief in Neōlin Soles!

Foot-tire sets the ball a-rolling. Body-tire falls in line. Soon that tiredness shoots through the body - borne on tiny nerve and muscle channels. Weary feet have destroyed work ability. Yours is a case for Neōlin Soles!

Neōlin Soles are kinder to feet than are leather soles. They rest feet through easy phancy. Foot-tiredness, it may be, will come, but *healthy* foot-tiredness not swollen, cramped, strained, sole-pained feet. Not with Neōlin.

Now on the point of foot-dryness: Neōlin Soles are damp-proof foot friends. They are better ground-grippers than leather. Add to these points longer wear and fewer shoe-bills and you too should welcome Neōlin, the scientific shoe-sole for grown-ups or children. In black, white, tan. The same on any price of shoe. No extra cost.

To avoid imitations, *mark* that mark; stamp it on your memory. Neōlin—

the trade symbol for a never changing quality product of

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Akron, Ohio

Neōlin

Trade Mark Reg U S Pat Off

Better than Leather

The Railroad Man's Dollar

Do you get the most for each dollar you spend? We have on our list, and we are in touch with, hundreds of firms in every line of business in the country. No matter what you want to buy (see the suggestion list on this page), The Railroad Man's Magazine will help you with information and advice that will insure economical purchase and complete satisfaction. *This service absolutely FREE*—All you have to do is to fill out the coupon below and mail it to the "Railroad Man's Dollar Department." By return mail we will gladly put you in touch with several firms that will give you complete information that will aid you in making a choice of the best articles and biggest values in their various lines. In a series of trade talks appearing on this page the Dollar Dept. will endeavor to give timely hints to readers.

"TOOLS, THEIR VARIETY AND USES"

This is the time of the year when every one, including the railroad company you work for, and yourself when at home, is busy putting up a new fence or repairing some damage done during the winter. No matter what the job may be, tools of some kind are absolutely necessary.

Whenever an inquiry has been received regarding tools, we have always recommended manufacturers whose goods are known throughout the world, and can be bought from almost any hardware dealer. In some cases, readers may find that the brands we suggest that they buy are a trifle more expensive than others their dealer has for sale. This is because it is an economy to buy the best quality merchandise.

For instance, there are different priced saws on the market. If you are a carpenter, or a man using tools in your daily work, you will know that the better grade saw is ground (with four gauges taper) from tooth edge to back and from toe to heel. Grinding is slow, expensive work but it adds greatly to the value of a saw. Those not full taper ground will bind in the cut; and would it not be a waste of money for a man to bother with such a saw, no matter how low the price?

In our talks with readers of this department we have continually cautioned them to be explicit in stating just what they want. This article on tools is written because of the many letters received on this subject, in which readers simply say they wish to buy a saw, wrench, or pliers, and often only "tools."

There are many styles of every tool made, and to help you solve your buying problems we must know just what you have in mind when writing to us. For example: Here are a few of the kinds of saws most popular among railroad men—hand saw, for general use; back saw, for cutting metal; buck saw, for logs, etc; compass and coping saws, for circular and curve work.

The many readers interested in wireless and telegraph work should be careful in naming the type of pliers they need, as there is a great variety, each serving some particular purpose.

Men in need of wrenches, drills, screw-drivers, planes or any other kind of tool, should remember that they are living in an age of specialists, and tool manufacturers are helping them speed up their work by equipping them with all kinds of labor-saving devices.

One last word about your hardware dealer—if, by any chance he tells you he does not carry a certain make of tool we have recommended, but has one "*just as good*," we suggest that you send us his name and address and we will try to show him the benefit he will derive from adding these particular goods to his stock.

Look through the advertising pages, and if you don't find what you want, write us on the coupon below.

We Can Help You Buy Any of These Things

Artificial Limbs	Lamps
Agents Articles	Leather Goods
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Boats	Musical Instruments
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Brushes	Overalls
Building and Construction	Patent Attorneys
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Civil Service Schools	Pipes
Correspondence Schools	Pocketbooks
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Electrical Goods	Salesmen's Courses
Engineering Instruction	Seeds
Firearms	Shoes
Food Products	Silverware
Fountain Pens	Sporting Goods
Fraternal Insignia	Telegraphy
Furniture	Tobacco
Gloves	**TOOLS**
Gun Clubs	Trap Shooting
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Hand Traps	Uniforms
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Investments	Watches
Jewelry	Wearing Apparel
	Wireless Outfits

Write name of each article together with name and address plainly in coupon below

Signing this coupon puts you under no obligation to buy.

The Railroad Man's Dollar Department, 8 West Fortieth Street, New York

Gentlemen

I am considering the purchase of the following articles, and would like to have your information and advice

. . . . . .

. . . . . .

. . . . . .

Name . . . . . Occupation . . . . .

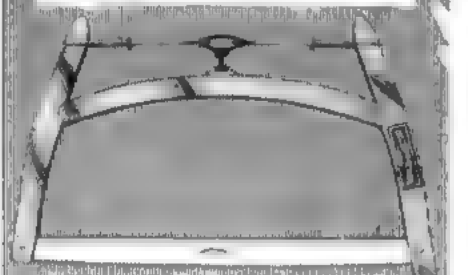
Address . . . . . .

6-13

84

SIMONDS

No. 6 Skew Back 26-inch Hand Saw, Polished Applewood Handle, Taper Ground Blade made of finest Crucible Steel. Price each **$2.25.**



Wood or Buck Saw No. [illegible] with [illegible] blade. Adjustable levers enable frame when [illegible] to be used over [illegible] [illegible] [illegible]

"What y' Doin' Now, Bill?"

You don't have to ask that question of a ***trained*** man, because you ***know*** his position is a permanent one—that he is not at the mercy of conditions that affect the ***untrained*** man.

You can always be sure of a good position and a good salary if you have the ***special training*** that puts and keeps you in demand. The International Correspondence Schools will bring ***special training*** to you, no matter where you live, or how little spare time or spare cash you have.

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Explain, without obligating me, how I can qualify for the position, or in the subject, before which I mark X.

☐ Locomotive Engineer	☐ R. R. Agency Accounting
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☐ Traveling Engineer	☐ Bookkeeper
☐ Traveling Fireman	☐ Stenographer and Typist
☐ Air Brake Inspector	☐ Higher Accounting
☐ Air Brake Repairman	☐ Mathematics
☐ Round House Foreman	☐ Good English
☐ Trainmen and Conductor	☐ Salesmanship
☐ Railway Conductor	☐ Advertising Man
☐ Mechanical Engineer	☐ Civil Service
☐ Mechanical Draftsman	☐ Railway Mail Clerk
☐ Machine Shop Practice	☐ Electrical Engineer
☐ Boiler Maker or Designer	☐ Electrician
☐ Steam Engineer	☐ Electric Wiring
☐ Steam Electric Engineer	☐ Electric Lighting
☐ Civil Engineer	☐ Telegraph Expert
☐ Surveying and Mapping	☐ Mine Foreman or Engineer
☐ R. R. Constructing	☐ Metal Miner or Prospector
☐ Bridge Engineer	☐ Chemical Engineer
☐ Architect	☐ Agriculture ☐ Spanish
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If name of Course you want is not in this list, write it below.

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FREE TRIAL
PLAPAO
Inner surface made self adhesive to keep the Plapao-Pad securely in place and the Plapao medication continuously applied.
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I make myself hear after being deaf for 15 years, with these Artificial Ear Drums. I wear them day and night. They are perfectly comfortable. No one sees them. Write me and I will tell you a true story how I got deaf and how I make you hear. Address

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We send you a genuine Lachnite on 10 full days free trial. Put it to every test. Learn for yourself its brilliancy, fire and wearing qualities. If you then decide to keep it pay us $4.75. Write now

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Genuine Lachnite Gems keep their dazzling fire for ever. They stand more than all kinds of jewelry. Write today for free new jewelry book and Catalog

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STANDS HOT AND COLD WATER 10?

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"I can hear you with the MORLEY PHONE." It is invisible, weightless, comfortable, inexpensive. No metal, wires or rubber. Can be used by anyone, young or old. The Morley Phone for the

DEAF

is to the ears what glasses are to the eyes. Write For Free Booklet containing testimonials of users all over the country. It describes causes of deafness, tells how and why the MORLEY PHONE affords relief. Over a quarter of a million sold.

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25 CENTS 35 CENTS 50 CENTS

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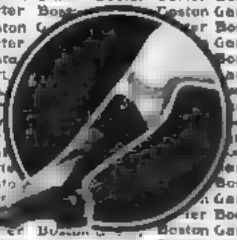

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A handsome, artistic [illegible] beautiful 100-page [illegible] It's free.

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Here Is Your Chance
Write for Extra Offer

I cannot send for Inspection Without One Penny Down

SEE DIAMOND FIRST

No security, no red tape we trust you absolutely. Examine diamond at your leisure—wear it 30 days FREE. Send it back at our expense if not satisfactory. You are under no obligation to buy. Direct from Factory to YOU, at Factory Prices. Save ONE THIRD to ONE-HALF of usual prices.

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at 1/40 the cost—IN SOLID GOLD RINGS

Stand acid test and expert examination. We guarantee them. See them first then pay. Special Offer: 1k Diamond ring 1 ct. [illegible] set in ring [illegible] 14k Solid Gold Set $4.98. Send [illegible] for unique Catalog FREE, showing full line. Patent ring gauge included. 10c. [illegible]
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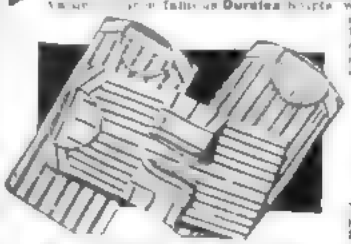
[illegible] shirts in the world guaranteed for a year to the wear of [illegible] new ones free. Order from this ad. Send no money. Send name and [illegible] Duratex Shirts we [illegible] in assortment of stripes, black and navy [illegible] coat style cuffs attached [illegible] laundered. Sizes 14½ to 17.



$2.85 for Three

Money back if not pleased. State size. Postage 10c.

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Illustrates and describes our [illegible] shirts, neckwear, soft and stiff cuffs, dress and sport shirts, underwear, [illegible] etc. [illegible] all guaranteed for six months' wear or new garments free. Send your [illegible]

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2000 ILLUSTRATIONS

Send Today for Your Catalog

This Handsome 116-Page Catalog contains over 2,000 illustrations of Diamonds, Watches, Jewelry. All the new popular styles are shown. Gorgeously beautiful Diamonds artistically set in solid gold and platinum mountings—exquisite things at prices to suit any purse. See at once anything desired, either for personal wear or for a gift, then ask us to send it for your examination, all charges prepaid by us.

You See and Examine the Article Right in Your Own Hands

If you like it, pay one-fifth of price and keep it; balance divided into eight equal amounts, payable one month apart. Send for Catalog today.

LOFTIS BROS. & CO., Dept. A 849, 100 to 108 N. State St., CHICAGO, ILL.
(Established 1858. Stores in: CHICAGO, PITTSBURGH, ST. LOUIS, OMAHA)

The Loftis "Perfection" Diamond Ring is our great special. Only fine, high grade Diamonds, perfect in cut and full of fiery brilliancy, are used. Six fiery Diamonds set in our famous Loftis "Perfection" 14k solid gold six prong ring mounting. Our large Catalog shows

Wonderful Values at $25, $40, $50, $75, $100, $125

EASY CREDIT TERMS

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This Is the Ring She Wants

National Credit Jewelers

Mr. Edison's Wonderful Phonograph

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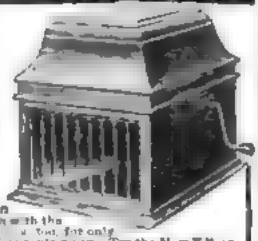

Yes, you may keep this New Edison. Thomas A. Edison's great phonograph, with the diamond stylus and your choice of two records, for only $1. Pay the balance a few cents a day. Try the New Edison in your own home before you decide to buy. See if no money down. Entertain your friends with your favorite records. Then return it at our expense if you wish.

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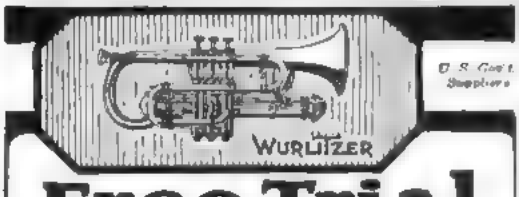
The ONLY perfect non-refillable ink pencils at moderate prices.

Two Sizes. 4½ and 5½ ins. Red or Black. Either size, black only $1.00. Your name in gold, $1.50. FREE Interesting booklet on Ink in the Arts. Pencils used by telegraphers. Agents Wanted.

Order today $1

J. Z. ULLRICH & CO., 27 Thames St., New York



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Free Band Catalog. Write today for 194-page book of all musical instruments. We are making astounding offers on all instruments. Write now. The catalog is free. Mention instrument you play. Catalog Free.

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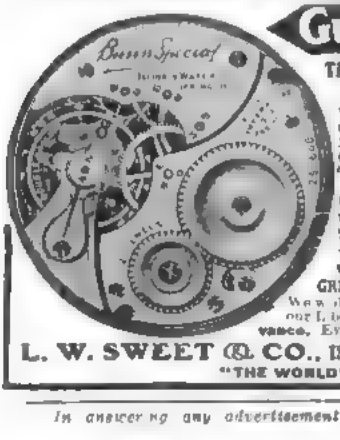

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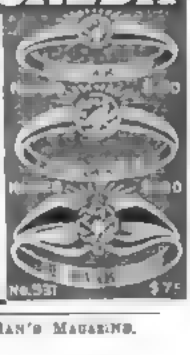

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- ☐ Trainmen and Carmen
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- ☐ Mechanical Engineer
- ☐ Mechanical Draftsman
- ☐ Machine Shop Practice
- ☐ Boiler Maker or Designer
- ☐ Steam Engineer
- ☐ Steam-Electric Engineer
- ☐ Civil Engineer
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- ☐ Bridge Engineer
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- ☐ Bookkeeper
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- ☐ Electrical Engineer
- ☐ Electrician
- ☐ Electric Wiring
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B9

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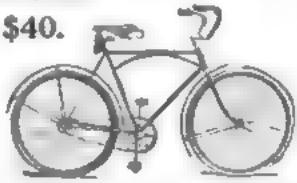
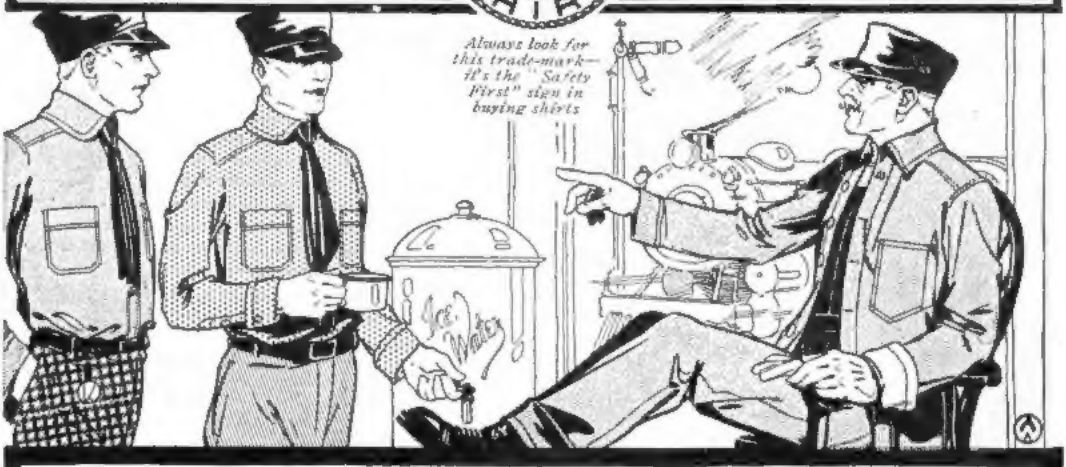


B10

Signal Tub Test Coat Style Shirts



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B12

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